p. 97
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TECHNOLOGICAL HORIZONS IN EDUCATION

JOURNAL

Vol. 12, No. 5, January, 1985

Computers in Education Worldwide

A BUREAUCRAT'S GUIDE TO WORD PROCESSING

Now, if it were you or I and we wanted a word processing program for our IBM-type PC, we'd probably stop off at our local computer store and simply diddle with a few.

You and I, however, are not the U.S. Department of Agriculture.

(Nor any of its permutations of subsystems like the Economic Research Service, National Resources Economics Division, Data Services Center, etc., etc.)

So when the USDA told ERS to tell NRED and DSC to look into a truckload of w.p. programs for all their PCs, the last thing they wanted was simple diddling. Their dedicated Wangs and Lexitrons were far too few to handle their needs, their IBM® PCs weren't compatible with them anyway, and nobody really, quantifiably, knew from word processing with a personal computer.

Definitely not a diddling-mode condition.

As they put it in The Exchange, an internally distributed publication of the Department of Agriculture: "A needs assessment showed that, in the long-term, a word processing system is needed that can increase word processing capability and also be compatible with ERS' Long Range Information Management goals."

Well, "Needs assessment" led swiftly to "procurement action," which galloped into an "objective review" of the eight top-rated PC programs on the market (as compiled by The Ratings Book published by Software Digest), along with WordStar® and Display Write 2, because they had some around.

Thus armed with the names, the final evaluators (a team of secretaries from NRED who would be the primary users of the PC software) became armed with each of the programs, along with checklists to record such things as ease of use, advanced features, and similarity to their existing dedicated equipment.

Since NRED has some hard disk base systems, any packages that were copy-protected could not be transferred to the hard disks, and were eliminated on that basis alone. OfficeWriter™ and SAMNA WORD™ II were the first to go.

Next, IBM's Diplay Write 2: because it's "not compatible with other software used in ERS (like Lotus™ 1-2-3,™ dBase II,® etc.)," and it's "full of confusing menu options and cryptic error messages." Au revoir IBM.

Then, three more, for a variety of reasons. Which left:

Volkswriter® Deluxe™
MultiMate™
Leading Edge™

Volkswriter® Deluxe? "Too complicated and confusing." Not "easy to learn or use."

MultiMate? Not bad. It actually tied the winner in a few categories.

The winner being the one that won 82% of the votes in the Ease of Use/Ease of Learning categories. The one about which they said, "The ability to store deleted text and automatic document backup features were both highly desirable." The one they thought they'd quickly "be able to use . . . for their day-to-day word processing tasks."

The whole process took some three months of work by people in DSC to support the NRED in its work with the ERS and DSC to make the world a better place for the USDA.

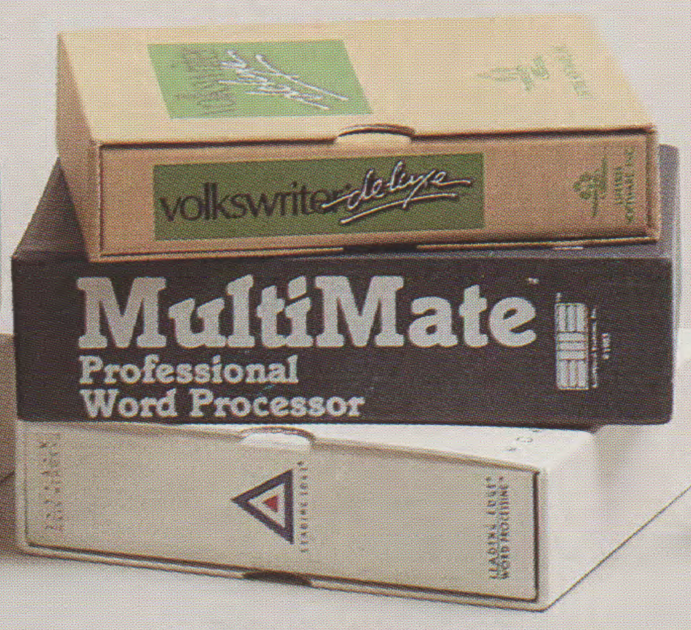
But the results were well worth the wait. Because at last they've solved their word-processing problems . . .

"With Leading Edge!"

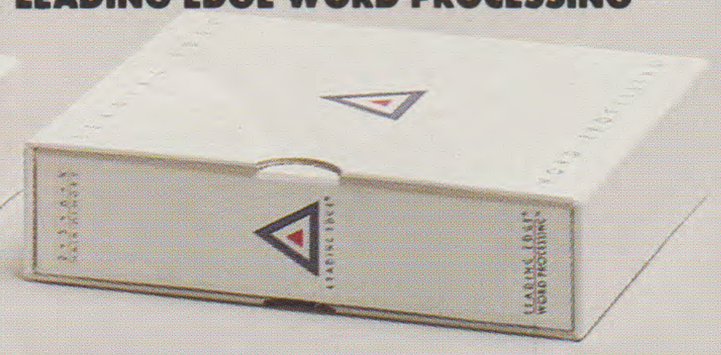
LEADING EDGE

THESE ARE THE PACKAGES THE COMMITTEE EVALUATED:

THESE WERE THE FINALISTS:



THIS WAS THE WINNER:
LEADING EDGE™
LEADING EDGE WORD PROCESSING



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Display	Hi-res monochrome display standard	Monochrome display—$275. Monochrome controller—$250.
Memory	256K Standard	256K Standard
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Expandability	Expandable to 640K No additional boards	Expandable to 640K Must add two boards
Disk Drives	2—360KB Drives Standard	One Drive Standard Additional Drive—$425.
Battery Backed Clock/Calendar	Standard	Not available from IBM
Ports	Both Parallel and Serial Standard	Serial—$100.
Expansion Slots	7 slots Standard of which 4 remain open after expansion to 640K	5 slots Standard of which none remain open after expansion to 640K
Warranty	One Full Year parts and labor	90 Days parts and labor
Support	Lifetime no charge toll-free hotline Standard. The best in the industry	None on hardware. Software optional at $40 per call.
Service	Nationwide Service Centers	Nationwide Service Centers
Price	$1,995 Complete	$3,110 (Configured as basic Leading Edge PC)

*as of 10-4-84

LEADING EDGE PC: THE GREAT UNKNOWN

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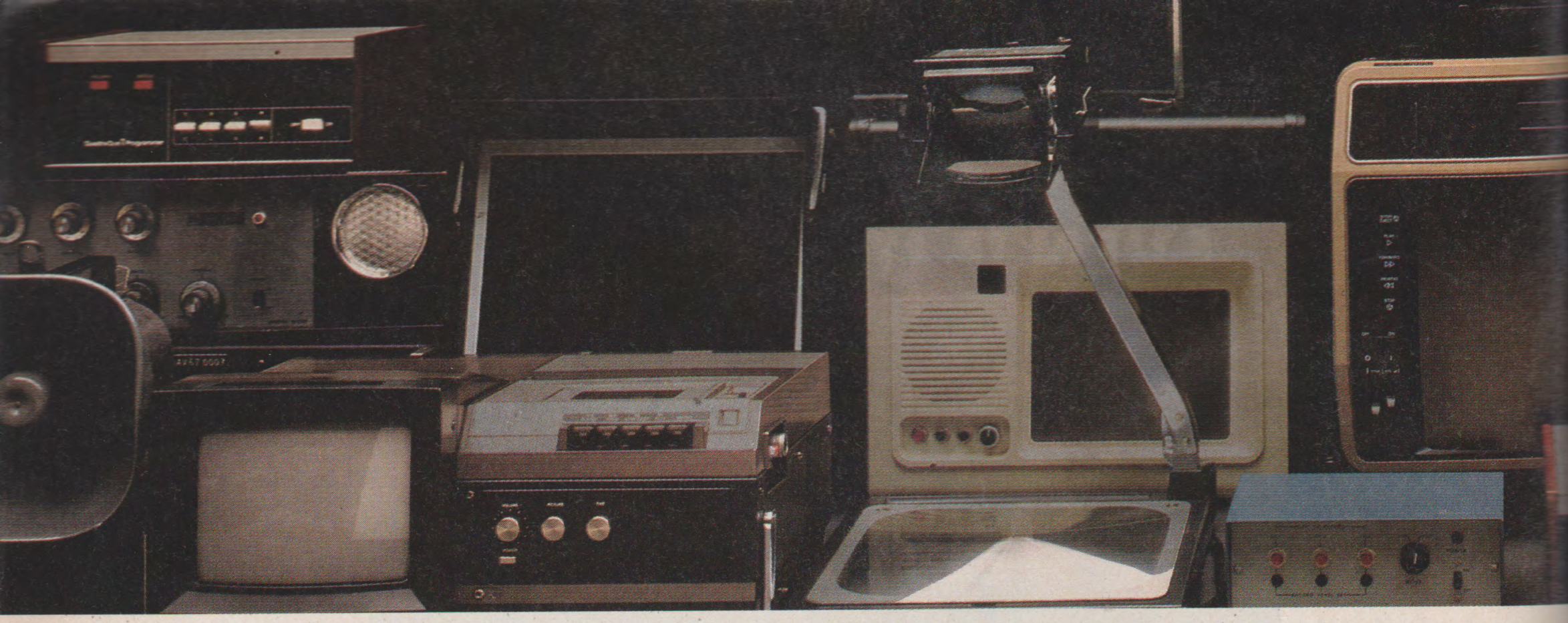

SUDDENLY, THE ENTIRE PRESENTATION IS REDUCED

SONY CONDENSES A ROOMFUL OF AUDIO/VISUAL EQUIPMENT INTO ONE INGENIOUS MACHINE.

As impressive as multi-media presentations can be, what's often even more impressive is the vast array of equipment it takes to put one on.

Equipment that's difficult to set up. Complicated to operate. And a real burden to travel with.

But now Sony has taken this big problem and knocked it down to size. The result: the new Sony Vidimagic™ video projection system.

The Vidimagic is a video projector, a videocassette recorder, a video-cassette player, a 181-channel cable-ready TV tuner, a loudspeaker and a public-address system—all tucked into one neat little 30-pound package.

And it's as easy to set up as it is to carry. There are no banks of projectors to synchronize, no reels of film to thread, no wires or cables to patch in.

All you have to do is focus. It will project a high-quality image from 30″ to 200″ (measured diagonally) on any white wall. A portable 55″ high-gain screen is also available as an accessory.

There's even a remote control with a built-in microphone for live narration during presentations. And there's a jack that allows you to hook up any VCR if you choose to buy Vidimagic without the one built in.

So you no longer have to be a logistics expert to put on an impressive show, or a weightlifter to take it on the road. All you have to do is write to Sony Information Center, Box 524, Dept. F.P., Bernardsville, N.J. 07924.

And find out more about the machine that lets you make multi-media presentations without a multitude of media.

WORLD OF MULTI-MEDIA TO THIS.

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Video Communications

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Get the $498 APT from RCA.

Today, more than ever before, you need timely, complete information to help make critical decisions, for research, for continuing education, and to meet other professional needs. Now, there is a wealth of data available from computerized medical information services such as AMA/NET℠, MEDLINE® and PHYCOM®.

You don't need a costly computer—or computer knowledge—to reach it. Just the $498 APT (All-Purpose Terminal), a telephone and a TV set.

Tap into over 140 medical services with APT.

With the touch of a single key, your APT terminal can dial a data base, log into the host computer, and let you select the information you want. With APT, you can quickly access your choice of computerized medical information services, ranging from electronic editions of major professional journals to specific diagnostic assessments and therapeutic regimens. You can scan or read published articles and abstracts, check clinical data on the latest drugs, determine drug interactions—even consult via electronic mail with a colleague across town or across the country.

APT can tell you what else is going on in the world.

Why restrict your need-to-know to medical matters? You'll be able to use the RCA APT with other time-shared services, too. By subscribing to resources such as CompuServe® and NewsNet® (which also provide medical information), you can access data on just about any subject imaginable. Through Dow Jones News/Retrieval®, for instance, you can get timely stock market quotes, investment updates, plus the latest business and financial news.

Use APT to reach other computers.

Even if you already use a computer for office accounting, patient records or insurance form processing, it probably can't communicate directly with other computers without expensive add-ons. But APT will...without tying-up your expensive office computer system. APT has a built-in phone modem—the electronic link you need to reach computer data bases. You can, for example, tie-in to hospital and laboratory computers, to get valuable patient and medical information—in your office, or wherever there's a phone and a TV set. And because the briefcase-size APT weighs only six pounds, it can be used practically anywhere.

If you want the benefits of computerized information... APT is the ideal way to start. It's a communications terminal that's expansive, not expensive—and compatible with most any display monitor, TV set, and many printers. APT connections and setup require no special skill or knowledge. You just follow the simple instructions in the complete APT User's Guide. The guide and all necessary hardware are included in the $498 price.

APT: no better way.

We know of no other professional quality computer terminal that can do as much as the RCA APT, and at such reasonable cost. That's why we invite you to take the next logical step. Call toll-free, 800-233-0187 (In PA, 717-295-6874) and ask for our full-color APT brochure. You can also order APT by phone— VISA and MasterCard are accepted. There's just no better way to access the medical world—and the whole world—to find and use the vital information that's waiting for you right now.

APT VP4801 terminal, $498.
Optional display monitor, $199.

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T·H·E
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JOURNAL

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ON OUR COVER

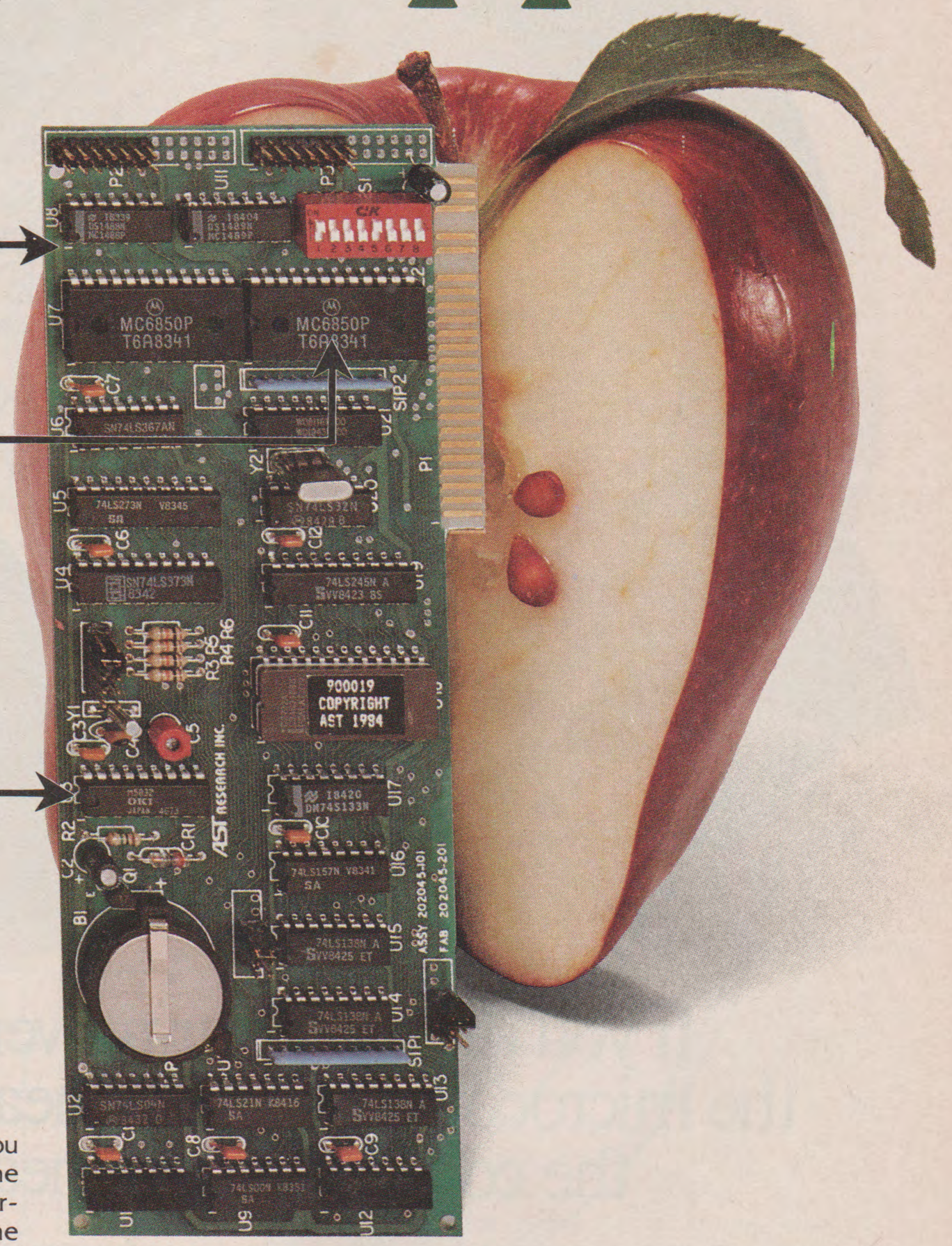
Perhaps more than any other human endeavor in history, the U.S. Space Shuttle is making known the need for "Computers in Education Worldwide." Without education . . . without computers and education intertwined, the benefits brought to almost every nation on earth by these space pioneers would not have been possible. Especially for T.H.E. Journal, Artists Bob and Tom LaDuke have portrayed this mandatory course for the world's next generation.

AST's into Apples!

Printer Serial Port

Terminal/ Modem Serial Port

Clock Calendar



At AST, we are consistently thinking of ways to help you get the most out of your personal computer. We set the standard with enhancement products for the IBM Personal Computer, and now we are striving to do the same for Apple™ computers.

Introducing Multi I/O,™ the most comprehensive enhancement board you can buy to fill the slots in your Apple IIe.™ With Multi I/O, you only need one board and one slot to do the job of three. You see, Multi I/O gives you a printer serial port, a terminal/modem serial port, and a ProDOS™-compatible clock/calendar with battery backup all on one card!

The printer serial port gives you the ability to access letter quality printers. Using the terminal/modem serial port you can communicate with others via a telephone modem or hook up another terminal. And no matter how you use your Apple IIe, the clock/calendar is silently ticking away, providing you with the accurate date and time even when your computer is turned off.

Interested? Wait, there's more. Multi I/O is easy to use and plugs into any of the slots typically designated for one of its three functions. Putting three functions on one card reduces power consumption so you won't have to spend any additional dollars on auxillary power. And if you compare prices, you'll find that for a few extra dollars, Multi I/O will provide you with three functions instead of one!

So, there you have it, another innovative product from AST. We've set the standard once, and we'll do it again by bringing you the type of quality you expect, but at a very low price. Visit your local computer retailer today, or contact AST Research for a dealer near you.

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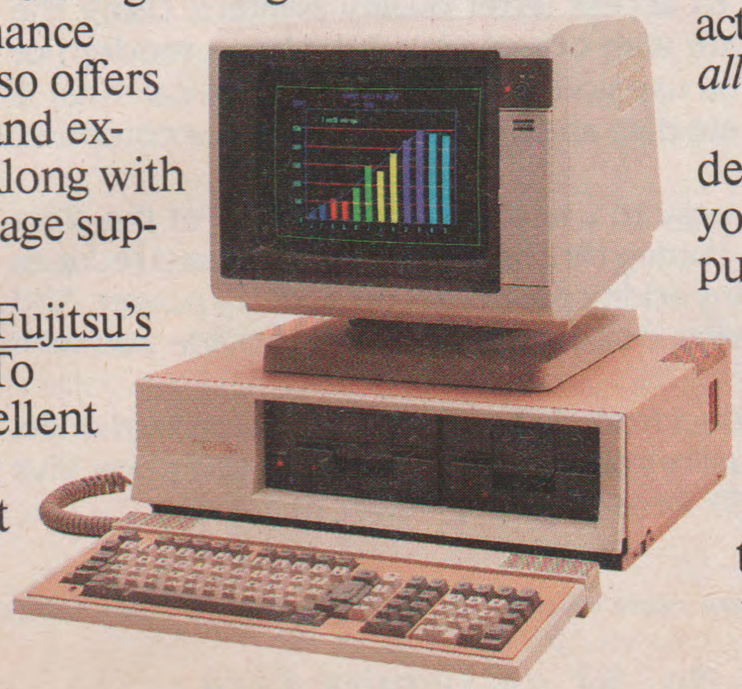
If you act fast, your university can catch the microcomputer that's nearly twice as fast as the competition for nearly nothing.

An exceptionally high clock rate gives Fujitsu's Micro 16s™ nearly twice the speed of other 16-bit computers. A real blessing to programmers. And a real boon to anyone else who wants to get their work done in a hurry.

But high speed isn't the only distinguishing characteristic of this high performance microcomputer. The Micro 16s also offers you quality, reliability, flexibility and expandability that just won't quit. Along with software and programming language support that's hard to beat.

More bytes for your bucks. Fujitsu's Educational Discount Program. To better acquaint you with this excellent tool for higher education, Fujitsu has created a special program that is only available to accredited four year colleges and universities. The Fujitsu Educational Discount Program.



With this program, qualifying institutions purchasing the Micro 16s will receive substantial price reductions on hardware and software. But you must act quickly. Because to receive these savings, *all orders must be shipped by March 31, 1985.*

There's no time to lose. For more details about this opportunity to save your school thousands of dollars on computer purchases or to arrange for a free demonstration of the Micro 16s, please call us toll free at (1) 800 556-1234 x83 (outside California) or (1) 800 441-2345 x83 (California only). While there's still time.

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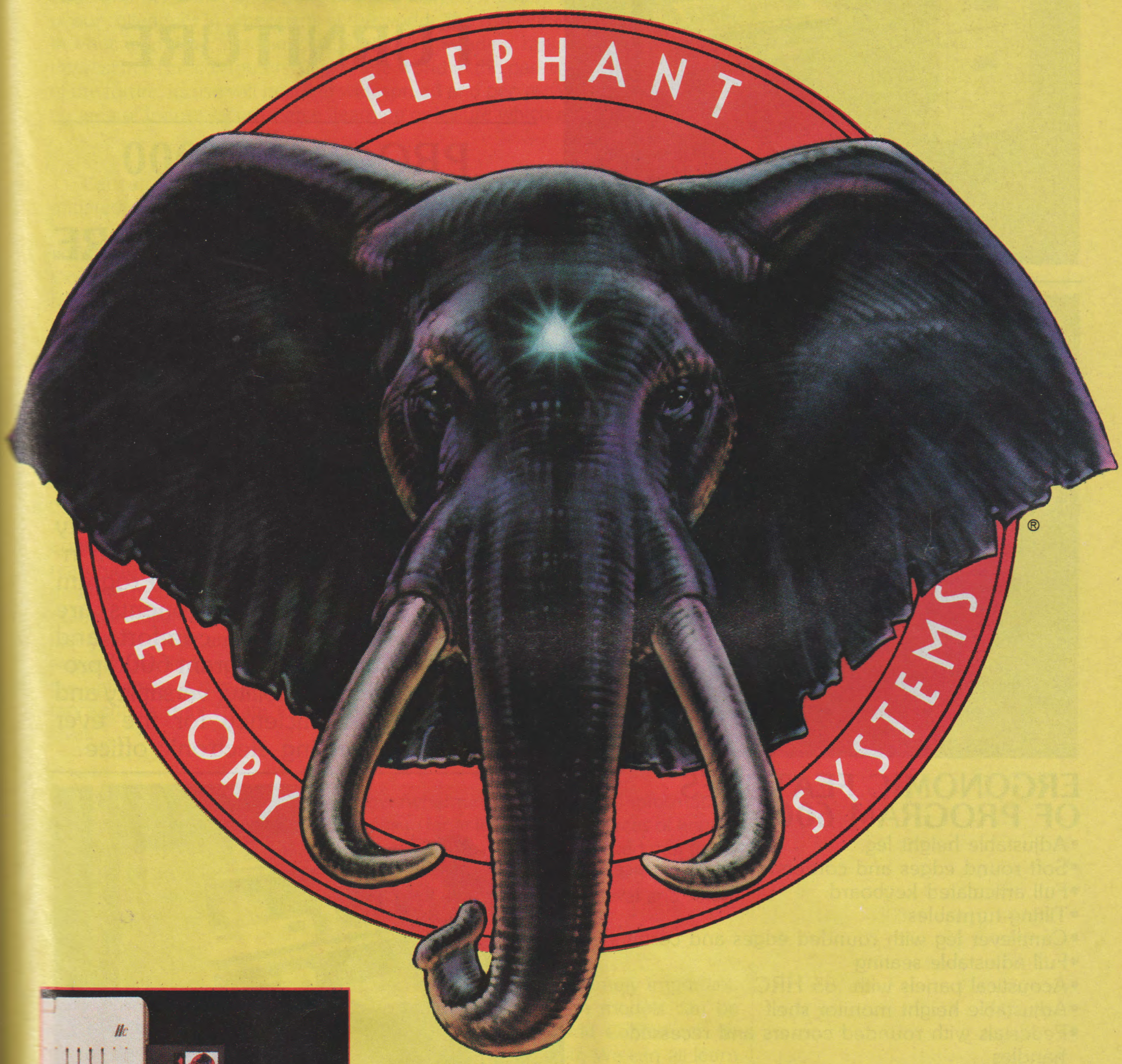
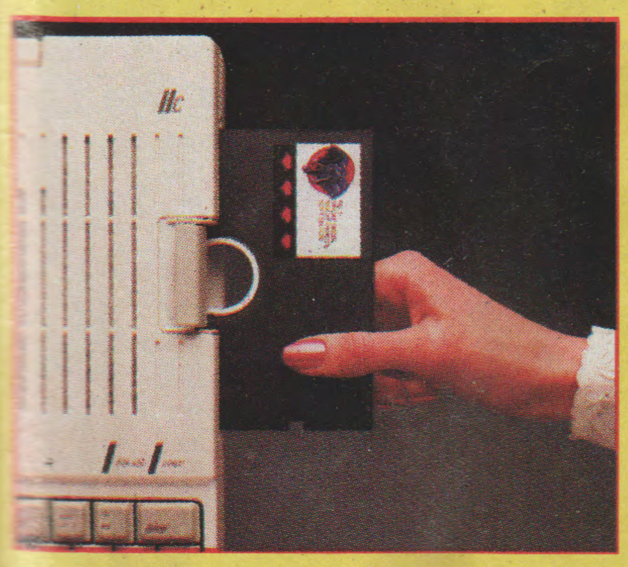
TEST DRIVE AN ELEPHANT.™





Elephant Floppy Disks are the perfect vehicle for storing and protecting data. Because Elephant never forgets. You'll get high performance that's 100% guaranteed for a lifetime of heavy use. So take them for a test drive. They're available now at your local computer showroom. And there's no waiting for delivery. For the Elephant dealer nearest you, call 1-800-343-8413. In Massachusetts, call collect (617) 769-8150.

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An integrated program of adjustable tables, acoustical panels and ergonomic seating. With Program 6000 you can create an open office layout with our complete integrated program or fill-in an existing office with adjustable terminal tables or security cabinets. Ergonomics is an integral element of Program 6000, all components are designed for comfort and function. Program 6000 provides flexibility, versatility and cost-efficiency for the ever changing electronic office.

ERGONOMIC FEATURES OF PROGRAM 6000

- Adjustable height leg
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Editorial

It has been T.H.E. JOURNAL's custom for a number of years for the January issue to provide an opportunity to share with our readers some of the activities of our colleagues in other parts of the world. The use of information technology in education, and in society generally, is spreading rapidly. If the enormous interest in microcomputers all over the world in the past two years is indicative of the future, its use will become widespread and pervasive. There seems to be no area of industry, commerce, learning or leisure which is not affected.

Educators in many countries are seriously exploring or have already initiated programs using computers in education. Of growing interest is the introduction of computers in elementary education. For example, the International Symposium on Computers in Children's Education held in Mexico City in October 1984 focused on the applications of computers for young children and how to promote the use of computers as a required topic of instruction in elementary schools. As an invited speaker, I discussed issues and trends. General agreement prevailed that many of the issues are similar in the developing and developed countries. A meeting is now being planned for Bulgaria in May, on the use of computers for children. In Ontario, Canada, a new educational computer is being designed under government auspices. The first software packages which will be made are for very young children.

In general, these main areas are being emphasized in introducing computers to young children: English development and discussion skills, logic and reasoning in mathematics, keyboard skills and computer familiarization. With the introduction of computers to young children and the growing use of computers in secondary schools, a higher level of computer awareness is evident in first-year college and university undergraduate students. These students are expecting to find a range of computer facilities to assist them in their studies at the university. A danger does exist that development in primary and elementary schools may create expectation which cannot be met at the university level.

We may anticipate access to an overwhelming abundance of information, facts, descriptions and easy connections to large information sources of knowledge, even by very young children. However, it must be recognized that this is likely to be true for some parts of the world but not for all. Many bodies of information will also need to be interpreted, and issues of retrieval and selection resolved.

Mutually sharing our experience and our findings is extremely important. Similar problems exist in many countries. Implementation models can be shared and modified. We look forward to the fourth World Conference on Computers in Education to be held in Norfolk, Va., this year. We can all learn from each other.

Sylvia Charp
Editor-in-Chief

News

Networking System Links Macintoshes

The Sun Mac networking and universal mass storage for the Apple Macintosh microcomputer from Sunol Systems links up to 32 machines by utilizing the Applebus.

Multiple Sun Mac's can be configured by using Sunol's Sun Net, increasing the network far beyond the 32-user limit of a single Sun Mac.

Additional memory may be stored with the Sun Disk from Sunol. Usable

LINKS UP TO 32 MACINTOSHES

storage capacities per disk are 8, 16, 25, 65 and 92 Mbytes.

Backup can be provided using the Sun Safe random access backup tape system. This removable tape cartridge is a standard ¼" tape with up to 21½ Mbytes of storage.

Sun Share provides a common storage area to be accessed by all users. It allows transfers of files between different types of operating systems, disk formats and to the Sun Server.

The Sun Server is a printer/communication server consisting of two serial RS-232 ports. It accommodates two printers or two modems or a combination of the two. It automatically handles multiple printing and communications tasks without user intervention. *Sunol Systems, Pleasanton, CA.*

Write No. 412 on Inquiry Card

Mind Olympics Slated for June

The 1985 Olympics of the Mind (OM), sponsored by Commodore Business Machines, Inc., will be held on June 6-7, at the University of Maryland, College Park, Md.

Requests for participation by unaffiliated teams must be received no later than April 1, according to an OM spokesman.

Founded in 1979 to foster creative problem solving among school children, OM is an extracurricular contest in which 150,000 students from 4,500 schools worldwide participate in solving mental games.

Commodore is developing a challenging computer problem as one of the events and will supply more than 50 computer systems for participants to use. The company will also organize workshops for parents to demonstrate educational software.

Write No. 402 on Inquiry Card

Research System Recognizes Spoken English Sentences

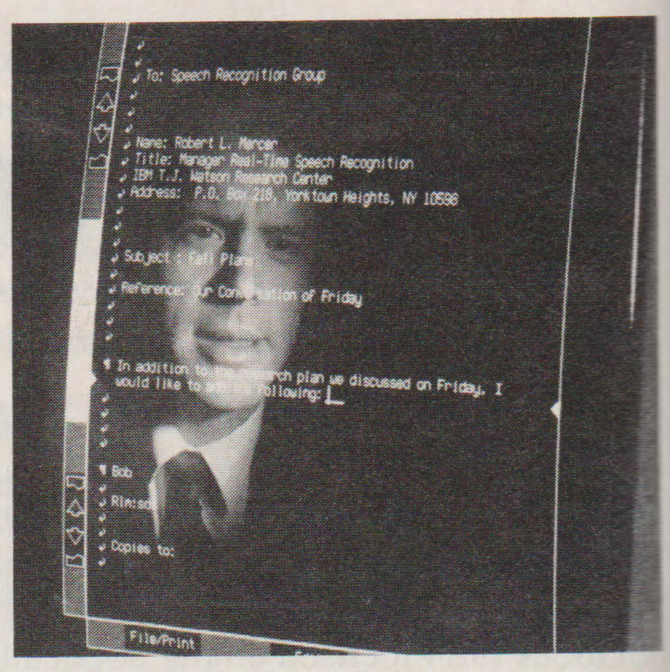
IBM research scientists have succeeded in developing an experimental system that quickly and accurately recognizes spoken English sentences.

The experimental system, developed at IBM's Thomas J. Watson Research Center, allows human voice input to create office documents such as letters and memos. It can recognize sentences composed from a 5,000 word business correspondence vocabulary, and identifies more than 95 percent of the words in these sentences correctly, a company spokesman said.

Designed to adapt to individuals, the system "trains" itself to recognize a person's voice by "listening" to the user read a brief standard text. The system requires a short pause between words during both training and dictation. A small microphone on the user's desk picks up the speech.

Once the system is trained, words, phrases and sentences appear on a workstation screen as the individual speaks. The resulting letter or memo may be edited or amended by voice or keyboard.

The recognition technique is statistical. It functions by determining the degree of similarity between the speech and the words in its vocabulary, as well as the probability that they would be used with other words in the sentence.



SYSTEM HAS 5,000-WORD LIBRARY

Both pronunciation and context are considered, so that the system can distinguish between "to," "do" and "through" because they are pronounced differently and between "to," "too" and "two," based on the surrounding words.

Words not stored in the vocabulary can be used in documents by spelling them out, and new words that will be frequently employed can be verbally added. The next objective of the research team will be to enlarge the vocabulary, the spokesman said.

Write No. 421 on Inquiry Card

University Buys 26 CAD Systems

The University of Santa Clara in Santa Clara, Calif., has contracted the purchase of 26 AutoCAD packages from Autodesk, Inc. for its microcomputer-based CAD workstations.

The workstations will be used in the university's new CAD Center to teach basic drafting to the university's 200 engineering and mechanical drafting students.

The $135,000 project is designed to introduce engineering students to CAD basics and to encourage the use of new technology in drafting environments.

The course, titled, Introduction to Engineering Design, had previously been taught using T-squares and drawing boards.

Write No. 417 on Inquiry Card

(continued on page 14)

The only Modula-2 native code compiler for 8086/8088-based machines and VAX® systems.

All the strengths of Pascal, plus improvements in every respect.

Modula-2 is Niklaus Wirth's second generation programming solution. All the best features of his Pascal language plus major features for true modularity, support for multi-tasking, type checking between program modules, syntax improvements, and features for increased portability (to name just a few).

A complete program development system.

LOGITECH MODULA-2 includes a complete implementation of Wirth's design, plus 8086 large model support and additional LOGITECH modules (including display handling and dynamic string handling).

A complement of powerful debugging tools—including compile-time error checks and symbolic debugging—is included.

Professional support from the people who wrote LOGITECH MODULA-2.

LOGITECH's Modula-2 is a professional development tool, backed by the most professional support available for Modula users.

LOGITECH's complete Modula family:

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Don't start another project without considering LOGITECH MODULA-2.

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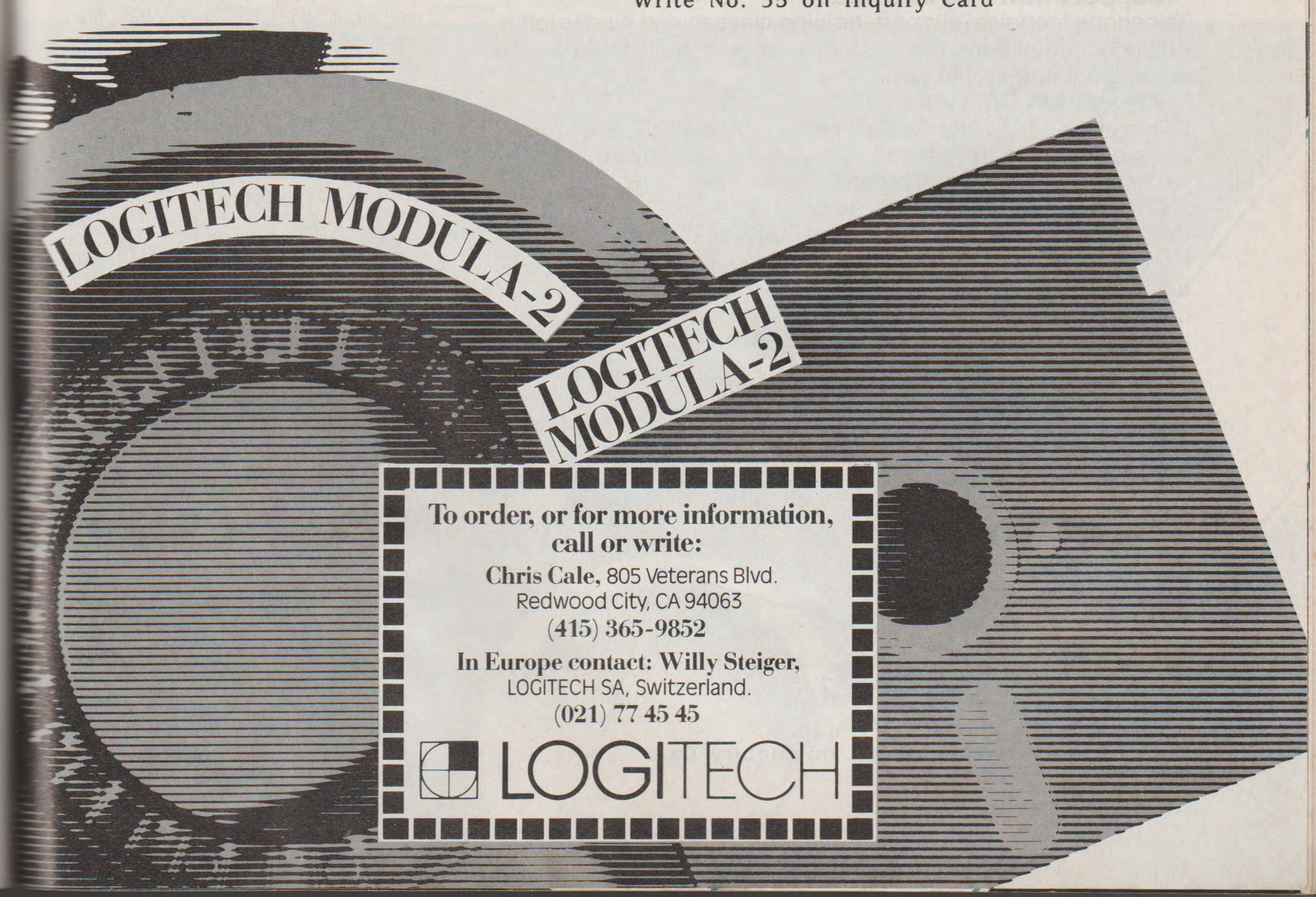

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News *(continued)*

Software Program Receives Award

The WISC-R Computer Report, a software program marketed by Southern Micro Systems of Burlington, N.C., has received an honorable mention in a recent national software competition sponsored by the Council for Exceptional Children.

It was recognized by the council for its contribution to the education of exceptional children.

The program provides the psychologist, teacher, counselor and other educational and mental health personnel with a printed summary report based on the client's performance on the Wechsler Intelligence Scale for Children-Revised (WISC-R).

Write No. 401 on Inquiry Card

Technical School Compacts Repair Training Course

A course which covers the IBM PC, computer peripheral devices, digital communications, laser technology, fiber optics and robotics is now offered by a New Jersey technical school.

A spokesman for the Brick Computer Science Institute in Brick, N.J., says that it is the first course of its kind in the state and one of the most advanced in the country.

"You can go across the United States and get educated in all of these things individually, but here you can get it all in one place," he said.

Titled Data Processing Equipment Repair II, the course is a continuation of DPR I which was introduced in 1974. It is compacted into a seven-and-a-half month period.

Facets of the course include instruction in programming languages on the IBM PC, computer communication systems, applied physics for fiber optics, lasers, robotics, and the repair of IBM PCs and peripheral devices.

The course also includes seven hours of training to show students how to write a resume, develop job leads and conduct themselves in a job interview.

Write No. 403 on Inquiry Card

(continued on page 16)

When all else fails.

Most diskettes are pretty good.

And some of the time that's good enough.

But next time you throw away one that won't format or you lose the cash flow analysis you've been working on for weeks, make a mental note to try a box of Dysan diskettes.

They're better.

So much better, in fact, that major computer manufacturers put their names on our diskettes and sell them as their own.

Without fear of failure.

You see, we make our diskettes better with advanced manufacturing processes that our competitors have yet to figure out.

And we test them.

Almost to the point of absurdity.

Dysan diskettes are inspected almost a hundred times as they come down the line. They're tested to performance levels way beyond industry standards. And each one is certified to be 100 percent error free.

Then our corporate quality assurance fanatics come along and check them all over again. For all the same things. Plus some things only they understand.

When we're done, you get exactly what you wanted in the first place. Diskettes that will record and retain all your data all the time.

We don't expect you to keep all that in your mental note, but we would like you to remember your last diskette failure.

And when your computer products dealer offers you another box of pretty good diskettes, tell him you're ready for something better.

Dysan.

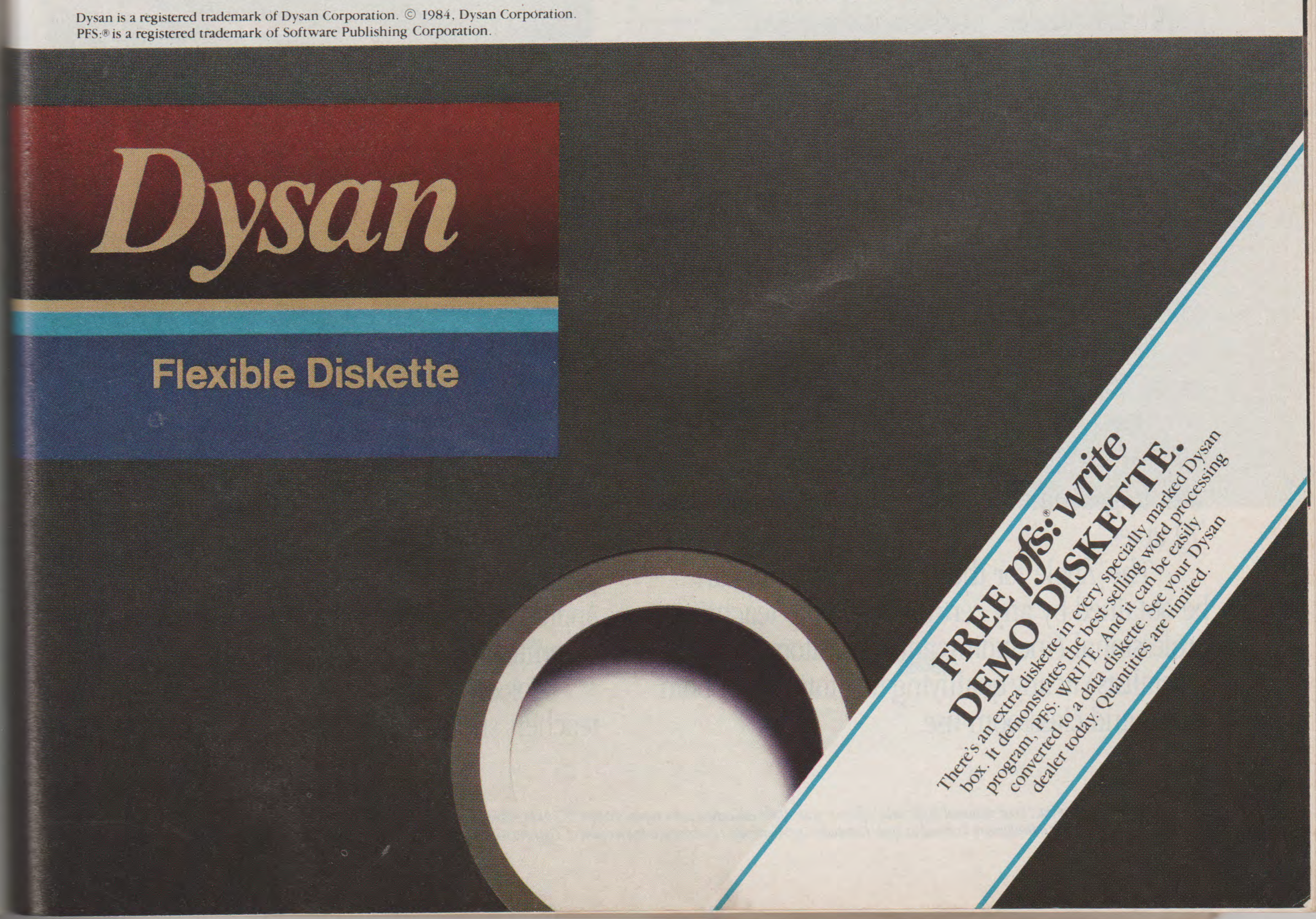
Call toll free for the name of the Dysan dealer nearest you. (800) 551-9000.

Dysan Corporation, 5201 Patrick Henry Drive, P.O. Box 58053, Santa Clara, CA 95050, (408) 988-3472.

Dysan®

Somebody has to be better than everybody else.

Write No. 41 on Inquiry Card



Apple announces a special spring break for teachers.

SILICON VALLEY, CA—Effective immediately, Apple Computer has announced a program that will give teachers a well-deserved break on Apple Personal Computers.

This "Apple for the Teacher" program offers a significant discount on the computer most used in schools, the Apple® IIe, and its more powerful descendant, the Apple IIc.

Apple II's have already logged over 200 million hours in the classroom—more than even the most dedicated teacher.

And both II's can access the world's largest library of educational software, everything from Gertrude's Puzzles™ to Mastering the SAT.™

Not to mention thousands of other programs (over 10,000 in all) for virtually every field of human endeavor. Whether it's writing notes to parents or balancing a checkbook.

According to informed sources at Apple, the teacher discount also applies to Apple's Macintosh,™ the business computer that's been accepted at colleges and universities all over America. (In fact, any freshman who can point, already knows how to use it.)

One teacher called the program "the best thing since summer." Another remarked, "I can't wait to get mine home to straighten out my '79 taxes."

The "Apple for the Teacher" discount can be obtained by any certified full-time teaching professional (including administrators and other specialists) at any qualifying institution—for both home and classroom use.

In fact, any teacher who successfully completes our credit application could qualify for an Apple Credit Card, making it possible to purchase a complete system with no money down.

For order forms and program details, teachers should write to: An Apple for the Teacher

For more information, contact your regional Apple sales office or your Apple education sales representative. © 1984 Apple Computer Inc. Apple and the Apple logo are registered trademarks of Apple Computer Inc. Macintosh is a trademark licensed to Apple Computer Inc. Gertrude's Puzzles is a trademark of The Learning Company. Mastering the SAT is a trademark of CBS Software, a unit of

c/o B&M Publications, P.O. Box 306, Half Moon Bay, CA 94019.

Most students reacted favorably to the announcement, save one, who mused, "My teachers knowing as much about computers as I do? It's a chilling thought."

News *(continued)*

Software Project Pioneers Features

The University of Northern Iowa Microcomputer Curriculum Project (MCP) has released a new software series nationwide, for Grades 5 through 11, which its developers say contains a unique technological development.

Schools contracting to use the 140 new and revised middle school, algebra I, geometry and algebra II computer software programs find that their students can go directly to any "page" without first sifting through preceding pages of the program.

"This has been a big problem in electronic learning," says Don Wiederanders, UNI professor of mathematics and co-director of the non-profit MCP.

"Learning has always been linear," he explains. "To get to point E, you always had to go through points A, B, C, and D, and you could only return to an item listed on the total program menu. Now you can get to any frame in a program, just as you can turn to any page in a book."

Other important technical features have also been developed by the MCP programming staff, Wiederanders adds. For example, students will find that text and graphics appear much faster on the high-resolution graphics screen. Each program also includes a routine that corrects the distortion of geometric shapes that is created by different-sized computer screens.

Write No. 409 on Inquiry Card

Tandy Awards 12 New Grants

The Tandy TRS-80 Educational Grants Review Board recently selected 12 recipients in the latest cycle of the Tandy TRS-80 Educational Grants Program.

The awards, in the form of hardware and software, were presented to the individuals for their proposals in response to the topic titled "Uses of Databases in a School Environment."

The names, institutions, locations and proposal titles are:

—Peggy Bias, Putnam County Library, Hurricane, W. Va., "Linking Four Branch Libraries in Rural Appalachia to the Regional Library";

—Dr. Rex G. Bickers, Children's Hospital, Columbus, Ohio, "Introducing Skills on On-Line Database Access to Resident Physicians in a Postgraduate Pediatric Training Program";

—Dr. Frederick Kreutzer, Sachem High School North, Lake Ronkonkoma, N.Y., "Creating a Nutritional Database for 11th and 12th Grade Health Students to Learn Database Search Procedures Providing a Means for Them to Examine Their Eating Habits";

—Dr. Karen Cantrell, University of New Mexico, Albuquerque, N.M., "Developing a Database Listing Support for Graduate Students in Anthropology";

—Robert C. O'Donnell, Township of Ocean Intermediate School, Ocean, N.J., "Establishing a Database of Career Resources for Students and Faculty for Utilization in the School Careers Program";

—W.T. Henry, Criswell Center for Biblical Studies, Dallas, Texas, "Teaching Students and Alumni the Benefits of the Microcomputer through 'User Friendly' Software";

—Walter L. Douglass, Florida Institute of Technology, Melbourne, Fla., "Using Computers in Assisting Faculty, Student Advisors and Students in Course Planning";

—Dr. Kenneth Milles and Dr. Jack Culbertson, Edinboro University, Edinboro, Pa., "Using Microcomputers to Create Model Research Databases Teaching Students Techniques of Computerized Literature Search in a Cost Effective Way";

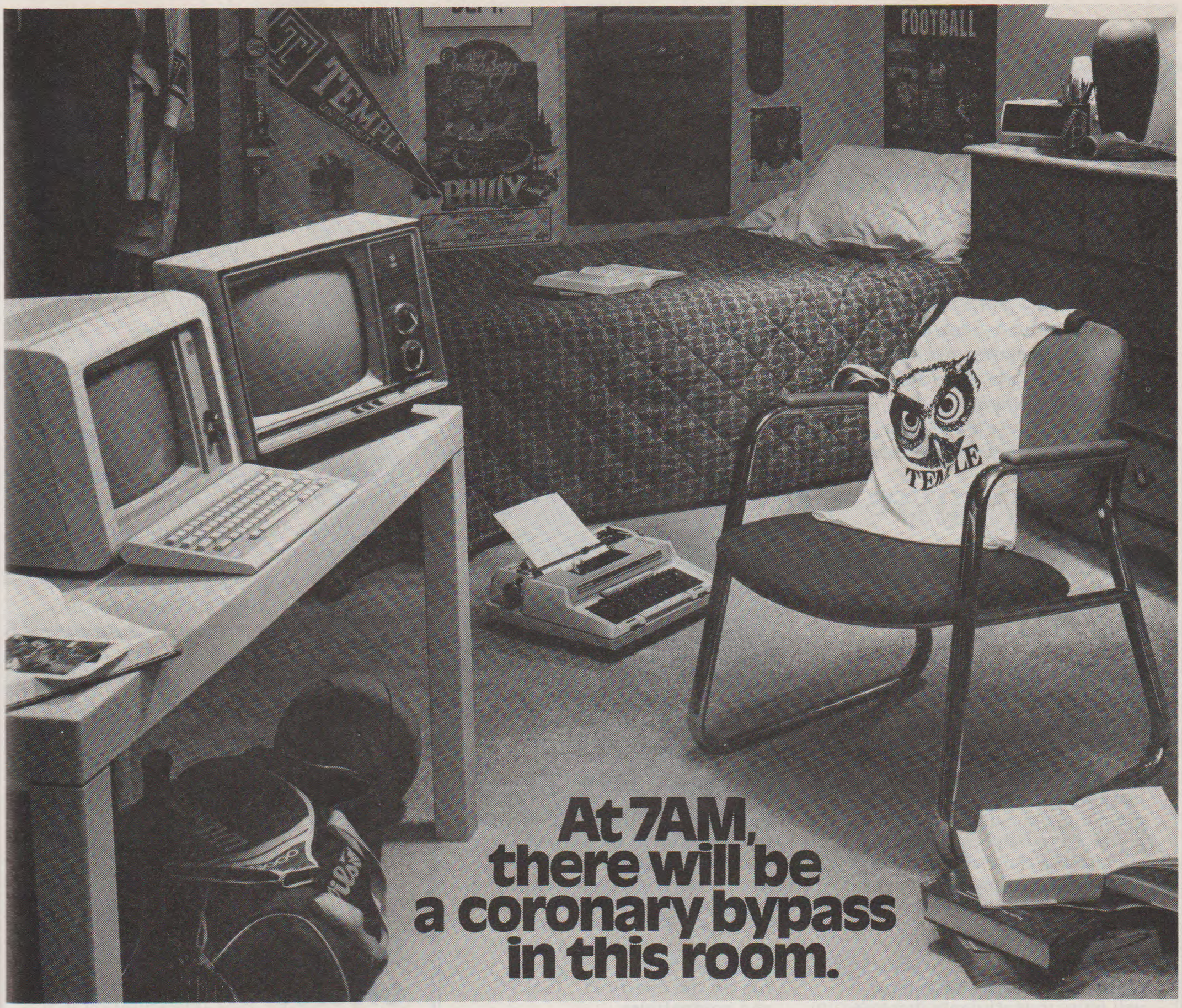
—Dr. Kathleen L. Schroeder, Ohio State University, Columbus, Ohio, "Creating and Using a Database for the Study of the Effects of Smokeless Tobacco on Oral Inflammation and Pathology";

—Dr. Ralph Grunewald, University of Wisconsin at Milwaukee, Milwaukee, Wis., "Using Standard Database Management and Inventory Programs to Track Radioactive Material"; and

—Amelia H. Mycoff, Seminole Community College, Sanford, Fla., "Using a Microcomputer to Create a Database for the Adult Handicapped Vocational Skills Program."

Write No. 427 on Inquiry Card

(continued on page 20)



At 7AM, there will be a coronary bypass in this room.

The surgery will actually happen a mile away, at Temple University Hospital. But a state-of-the-art communications system by Bell Atlanticom will bring the learning experience vividly to life in a dormitory room.

The impact of this system on Temple's students, faculty, and staff will be profound. It will be as if the 21st Century had suddenly arrived.

Students will be able to enhance late-night study with access to the University library, using personal computers in their rooms.

Faculty will be able to tie into outside data bases, for research information.

Computers presently serving the administrative staff at the various Temple campuses will be able to communicate directly, even though many different types of computers are involved. (A major achievement.)

And on and on.

Our job won't end with supplying the equipment. Bell Atlanticom is also responsible for system installation, integration, and maintenance. Including, of course, the telephones.

Few are so well qualified to handle the whole task. (Remember our Bell System heritage.)

Few can offer so broad and varied an equipment selection. From such respected sources as InteCom and NEC. Digital Equipment Corporation, TIE, General DataComm, and Esprit.

And few are so well prepared to serve all types of customers, small or large. Residential, commercial, or governmental.

Come to us for expert advice and counsel. For flexible and competitive pricing, whether lease or purchase.

Come to us for single-source responsibility in total communications and information management systems.

Bell Atlanticom.

A toll-free phone call will bring you more information: 1-800-252-BELL.

Write No. 20 on Inquiry Card

Bell Atlanticom™ Systems, Inc.

A Bell Atlantic™ Company

News *(continued)*

Computer Training Consortium Started

Attache Software, Inc., of Ann Arbor, Mich., developer of accounting software for business microcomputers, has announced the creation of the National Computer Training Consortium (NCTC). Spearheaded by Attache, the NCTC is a vendor-sponsored computer training program developed for nationwide community colleges.

NCTC member representatives from Wang, Otrona, Attache, Tandy, and ten community college systems held their first meeting at a three-day symposium in Houston last month.

"End-user training is an acknowledged weakness throughout the industry, and we believe the NCTC is the first to realistically address this problem on a national scale," said an Attache spokesman. "For the first time, industry and college representatives will jointly cooperate to develop college course materials standardizing the teaching of microcomputer hardware and software applications."

One-day classes will cover basic computer skills and software program instruction. Typical course offerings will include: database systems and word processing software; introduction to spreadsheets; and four concentrated courses on accounting software programs. Attache and Washtenaw Community College at Ann Arbor, Mich., developed the eight courses, also evaluated by 11 community colleges from around the country.

Gundar Myran, President of Washtenaw Community College in Michigan, has been an active recruiter of community colleges for the NCTC. "NCTC is the first program tailoring computer education to individual and business needs," he said. "Unlike previous vendor-sponsored programs, the NCTC doesn't treat colleges only as a market for discounted computer products."

Industry members feel that the NCTC is the first mass education model they can whole-heartedly support. End-user training by dealers and manufacturers usually has been unprofitable and largely ineffective. By offering courses in nationwide colleges, NCTC can economically provide quality education to more users.

Write No. 413 on Inquiry Card

Educational Discount Offered On Unix Software

Unisource Software Corp., of Cambridge, Mass., is offering a 44 percent educational discount on its licensed Unix software for personal computers. By special arrangement with AT&T and independent software developers Unisource now offers substantial discounts to qualified schools and universities on the Venix operating system and Unix application software.

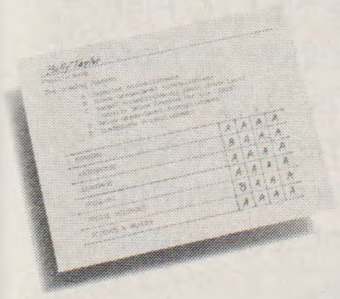
Under its Preferred Educational Discount Program, Unisource offers the recently released Encore version of Venix/86 which retails for $800, is delivered with a System V Unix license and is available for the IBM PCXT, AT&T 6300, Compaq Plus and DeskPro, Eagle Turbo, MAD 1 and the Leading Edge PC.

Write No. 430 on Inquiry Card

(continued on page 22)

Proven computer-assisted instruction.
It's time to take a close look at CCC.

Back in 1967, Computer Curriculum Corporation pioneered the use of computers in education. Since then, over one million students have grown up using our instructional systems. Using CCC courses just 10-20 minutes daily, these students have shown significant academic gains, confirmed by standardized tests. Today, we're still leading the way.



Academic gains.

Introducing the CCC MICROHOST™ Instructional System, A system that works for students, teachers, administrators

The CCC MICROHOST Instructional System allows students to work at their own pace and level. Every student is challenged, yet assured of success. And by eliminating time-consuming management chores, the MICROHOST's **automatic management system** gives teachers more time to teach. For administrators, the acclaimed UNIX™ operating system offers word processing, electronic mail, bulletin boards, and programming capability.

Our MICROHOST system also represents the state of the art in computer technology—fast, expandable, versatile—with up to 64 student learning stations.

And you get everything you need in one complete, cost-effective package:

- The widest selection of proven, high-quality courseware.
- A built-in management system that takes care of individualized student pacing, record-keeping, and printed progress reports—automatically.
- The MICROHOST computer, student learning stations, and all other necessary hardware.
- Plus, CCC's installation, on-going training, support, and maintenance.
- Not to mention our easy-to-use teacher handbooks, student textbooks, user manuals, and individualized worksheets in reading and math.

Handbooks, textbooks, manuals.

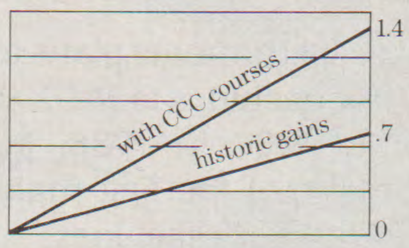
Years of instruction for elementary through adult students

CCC offers more than 25 courses, providing years of daily instruction. CCC courses teach math, reading, and language arts across many grade levels. We have **two new computer literacy courses,** one for elementary and one for secondary students.

Other courses focus on GED and programming, with audio instruction adding further dimension to ESL and beginning reading. Some courses can even be taken over the telephone! And new courses are continually under development, in electronics, writing, and computer science.

Nothing speaks louder than results

Of course, the best thing about CCC's integrated learning system is that it *works.* For example, Fort Worth Independent School District



Typical 1-year improvement.

reports that their low-achieving Chapter 1 students averaged ITBS gains of 1.4 years in one year—using CCC courses only ten to twenty minutes a day!

If **you** want results, call CCC today at **800-227-8324**

MICROHOST computer and SLS-11 terminal.

(in California, 800-982-5851).
You'll be glad you did...
for years to come.

Computer Curriculum Corporation

MICROHOST is a trademark of Computer Curriculum Corporation. UNIX is a trademark of AT&T Bell Laboratories.

Write No. 8 on Inquiry Card

News *(continued)*

Computer Network To Be Installed In M.I.T. Lab

The Laboratory for Computer Science at Massachusetts Institute of Technology (M.I.T.) has announced an agreement to acquire up to 400 Explorer symbolic processing computers from Texas Instruments, Inc. Over the next two years, these computers will be used to establish the world's largest network of list processing (LISP) machines, said a Texas Instruments spokeswoman.

The Explorer systems will help solve the "Tower of Babel" problem within the lab—where workers in the lab find it difficult to interact and share research on the wide variety of machines now in use, the spokeswoman said.

Texas Instruments plans to deliver up to 200 machines to M.I.T. this year, and up to 200 in 1986. M.I.T. will become one of the first major recipients of Explorer machines.

Write No. 428 on Inquiry Card

AT&T to Donate Computer Products To Universities

AT&T Information Systems has announced a program to donate $32 million worth of its 3B Computer products to major colleges and universities across the country. The computer equipment will be used in the schools' computer science and electrical engineering departments.

The first two schools to receive donations will be Columbia University and the University of Illinois at Urbana-Champaign.

Equipment to be donated will range from AT&T's 3B20 super-minicomputer to the desktop 3B2 super-minicomputer. Appropriate terminals and high-speed networking products to link the 3Bs will also be part of the donation program. In addition, AT&T will install the equipment and provide one year of maintenance support free of charge, a company spokesman said.

Under terms of the program, approximately ten schools will receive major equipment donations, with about three dozen other schools receiving smaller contributions. Announcement of the other selected institutions will be made as plans are made final.

Universities to receive the equipment have been chosen based on their developmental efforts in the computer science and electrical engineering fields; their commitment to campus-of-the-future technology; and their willingness to participate through involvement of faculty, students and administration.

At Columbia University, the School of Engineering and Applied Sciences will use AT&T computer products for students' classwork on computer-aided design projects and for faculty and graduate student research.

The University of Illinois will utilize its equipment in computer science and engineering undergraduate and graduate programming classes. The computer science faculty will also use the equipment in research activities.

Write No. 414 on Inquiry Card

Consortium Links Urban, Rural School Districts

A consortium of school districts in northeastern Minnesota has inaugurated a computer-based education plan designed as a national prototype for linking urban and rural students and teachers.

The Northeast Educational Technology Consortium (NEETC) project, valued at $468,000, is a result of a high-technology demonstration grant from the state of Minnesota and a partnership agreement between five participating school districts and Control Data Corp. NEETC covers eight school districts.

The consortium's objective is to provide high quality courses in math, science, computer literacy and business education. Its plan, employing Control Data's Plato computer-based education system, permits cost-effective sharing of computer-based educational equipment, expertise and in-service training.

Through a Control Data mainframe computer located in Minneapolis, the NEETC project schools will have access to thousands of Plato courseware hours. In addition to its primary focus in the areas of math, science and business, integrating Plato courseware into core curriculum areas and computer literacy, the program is structured to train teachers to use computer-based educational technology efficiently in the classroom.

William Norris, Control Data's chairman, and Editorial Board member of T.H.E. Journal, called the NEETC Plan "a classic illustration of how private industry, school districts and communities can work together to provide high quality education for rural America through the use of computer-based education.

"The means are now at hand to provide any rural community in Northeastern Minnesota or anywhere else with an affordable educational system that will best prepare high school graduates for direct entry into the world of work, vocational training or college, as well as for adult and continuing education," Norris said.

Write No. 418 on Inquiry Card

Schools Linked As Computer Resource Centers

With more than 500 participants to date, Commodore Business Machines, Inc. has formed Educational Resource Centers—a network of public and private schools and colleges using Commodore equipment, a company spokesman said.

Each school is linked directly to Commodore's Education Department through COMED, Commodore's educational special interest group on the CompuServe Information Service.

COMED acts as an electronic bulletin board for Commodore—using schools to share information with others about computer software, curriculum and teaching strategies they have developed.

In return, Commodore provides participants with a Vicmodem telecommunications access device, a subscription to CompuServe Information Service and updated information on innovations in new products, software, hardware, educational support materials, school computer happenings, resources for decision making, LOGO and technical assistance.

Write No. 404 on Inquiry Card

(continued on page 24)

How to keep your classroom in line.

Compute. Don't commute.

Computerized classrooms have tremendous teaching potential. But it's wasted if your teachers have to travel from desk to desk loading programs, feeding printers and storing classwork.

Especially when they could be using an OMNINET™ Network. With all your computers sharing the *same* printing, data storage and backup equipment.

And since teachers can enter common courseware from a master station, they can also monitor any student's progress from that same station. Whether students work individually or in groups.

Economics made simple.

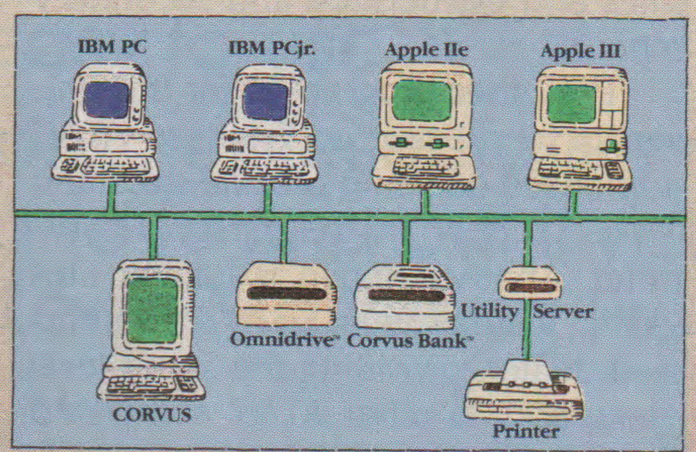
Why spend money on peripherals for individual stations? An OMNINET Network lets you consolidate your investment in shared, high-performance printers and memory systems.

CORVUS offers you a choice of everything from hard disk storage right through to storage backup devices.

And because OMNINET uses simple, telephone-type wire, it's the most cost-effective network you can install. Or expand.

The easier-to-work network.

We've learned a few things which make our new Constellation II software



easier for you to learn. And use.

Completely revised and simplified Constellation II documentation lets you turn OMNINET into a star performer in no time. Starting with comprehensive, menu-driven installation and utilities sequences.

There's even a brand new data security system. So once you get OMNINET broken in, you don't have to worry about the mischievous breaking into it.

Achievement tests.

We did a lot of homework to become the #1 network in the world. See for yourself by clipping the coupon or calling us at 800-4-CORVUS.

We bet you'll discover why CORVUS has become a synonym for educational networking. How can you respond?

★ Put your school on the line.

CORVUS
The Networking Company.

☐ Please send me Omninet literature relating to my _____ computer.
☐ I'd like your free booklet, "Networking: Questions to ask before you buy."
☐ I'd like information on CNEEUG, the CORVUS End Users' Group.

Name _____
School _____
Address _____
City _____ State _____ Zip _____
Phone ( ) _____

CORVUS, 2100 Corvus Dr., San Jose, CA 95124

Write No. 30 on Inquiry Card

Planning Grants Given to Graduate Business Schools

Forty universities have been awarded planning grants as part of a $25 million grant program to help improve graduate instruction and research in the management of information systems, International Business Machines Corp. (IBM) announced recently.

The 40 graduate schools of business and management were selected from among 218 schools that submitted preliminary proposals to IBM. These preliminary proposals outlined development plans and anticipated cost requirements to develop faculty skills and graduate courses of study in the management of information systems.

Ultimately, 12 universities will be selected, based on final proposals, to receive up to $2 million each in cash and IBM equipment. The planning grants, ranging from $5,000 to $12,000, will help to defray the costs of preparing the final proposals.

Write No. 406 on Inquiry Card

Computer Training Centers Open Coast-to-Coast

A nationwide network of computer training centers, staffed by professional teachers and outfitted with new IBM PCjr personal computers, is now in operation to train teachers to use computers.

The National Computer Training Institute (NCTI), said to be the first of its kind, opened in November with 90 training centers in 49 states, each equipped with 15 new IBM PCjr personal computers, peripherals, software, and staffed with 180 NCTI instructors.

NCTI, an independent organization, plans to open a total of 200 training centers in cooperation with IBM by the end of 1985.

The training centers will be located on school campuses and the computer equipment will be available for use by students during the regular school day at no charge to the school. NCTI classes will be held in the evenings, on weekends and during vacation breaks.

The training centers also will serve as a nationwide communications network—linked together through The Source Information Network—to all NCTI instructors and their teachers/students to exchange information, receive course updates and keep abreast of the latest developments in computer education.

The initial NCTI course titled Using Computers Personally and Professionally: A Realistic Course for Educators covers 45 hours of instruction. Subject matter includes an introduction to computers, word processing, graphic arts, databases, spreadsheets, BASIC, communications, applications software and planning for instructional computing.

Teachers who successfully complete the NCTI course can earn credit from a local university.

The NCTI course initially is aimed at teachers at the K through 12 grade levels, although others in education may enroll.

Write No. 408 on Inquiry Card

Personal Computers Offered at Discount Prices

Two programs have been announced by AT&T Information Systems which allow educational institutions to purchase AT&T Personal Computers at discount rates.

The first program offers discounts of 14 percent for one to 20 units and 30 percent for 20 to 500 units to two-year and four-year colleges or universities and elementary and secondary schools.

The other program is for the university to subcontract from an AT&T authorized dealer to provide sales and service support of the personal computer. Another option is for the university to operate as an AT&T authorized dealer, providing the same level of support as other AT&T authorized dealers.

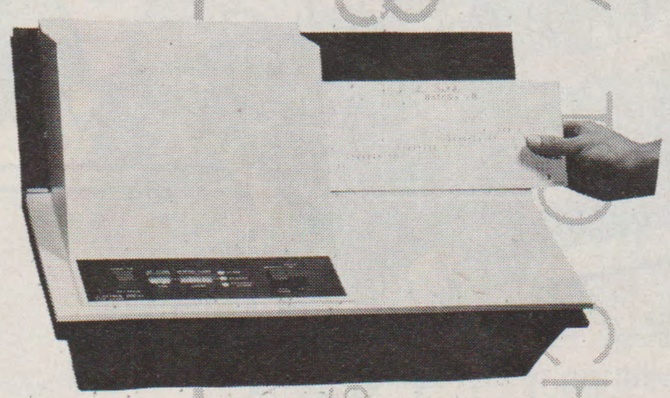
Worcester Polytechnic Institute in Worcester, Mass., has become the first college to take part in the offer.

Write No. 415 on Inquiry Card

(continued on page 26)

We Will Loan You This SCAN-TRON® To Score Tests!

Scan-Tron® Optical Mark Reader Test Scoring Machines are loaned with no charge to more than 6000 schools that qualify for the Loan Marketing Program.



SCAN-TRON® Model 888 OMR Test Scorer

Scan-Tron® OMR Test Scoring Machines read multiple choice test forms, mark the incorrect answers, and print the total of correct answers on the test form to be returned to the student.

Scan-Tron® OMR Test Scoring Machines are fast, accurate, and easy to use.

Call the Scan-Tron® representative near you for a demonstration and to find out if your school qualifies for the Loan Marketing Program.

SCAN-TRON®
CORPORATION
2021 East Del Amo Boulevard
Rancho Dominguez, California 90220
Phone (213) 638-0520
Toll Free outside CA (800) 421-5066

Write No. 12 on Inquiry Card

News *(continued)*

Disc-Sharing Deadlines Set

Learning Link Corp. of Salt Lake City, Utah has announced its 1985 deadlines for delivering materials to Learning Link to be premastered for inclusion on laser videodiscs as part of its disc-sharing program.

The demand for placing small, pilot projects onto videodisc at an affordable price led Learning Link to develop the program, a company spokeswoman said. Two or more projects are placed on one disc, and participating companies divide the cost of pressing the disc.

The deadlines will be every other month on the 15th of the month. The first deadline in 1985 is January 15. Deadlines are set on a regular basis so project directors can plan their projects accordingly and know that they can save money by sharing the pressing costs with others, the spokeswoman added.

Although the emphasis is placed on getting as many slides as possible on one disc, motion clips are also accepted on a disc-sharing basis.

The program is popular among people who are experimenting with videodisc applications, the spokeswoman said. They can place a pilot project on disc at an affordable cost. A large investment isn't needed to test ideas.

Write No. 407 on Inquiry Card

Microcomputers Featured in Eight-Part Series

Ready or Not is an eight-part series on microcomputers in education produced by School Television, North Carolina Department of Public Instruction, in cooperation with Mississippi Educational Television.

The programs are attracting attention for two reasons, said Elsie L. Brumback, assistant state superintendent for educational media and technology. "First, the use of microcomputers in the schools is accelerating, but we have found very little quality inservice instruction on how to best use these new educational tools," she said.

"Second, behind Ready or Not is the international reputation of the staff of Educational Media and Technology Services, who designed the series," she added. "North Carolina's reputation in the field of educational technology is well known in education circles."

The series is designed to help educators plan for and use microcomputer courses available, ranging from sophisticated laboratory simulations to arcade-like instructional games.

"Ready or Not carefully outlines the types of courseware, explains the advantages and disadvantages of each type, and shows how to recognize the good from the bad in each category," Brumback said.

Included in the series are on-site visits to schools and in-depth applications of computers in the arts and in writing.

The series is currently being broadcast over PBS and The Learning Channel. It is also available on videocassettes.

Write No. 431 on Inquiry Card

(continued on page 28)

A country* needed five hundred learning labs.

A school needed one.

They both came to Tandberg.

Most important, they came to us for the same reason.

Each needed a learning lab that combined advanced technology, easy operation, great flexibility and total reliability. Another major consideration: value.

And like so many others, they respected Tandberg's twenty years of leadership in the design and manufacture of learning laboratory systems.

All this virtually defines Tandberg's three learning labs. All are microprocessor-controlled, and provide selective intercommunication with students in Level II (audio active) and Level III (audio active record) in any required combinations.

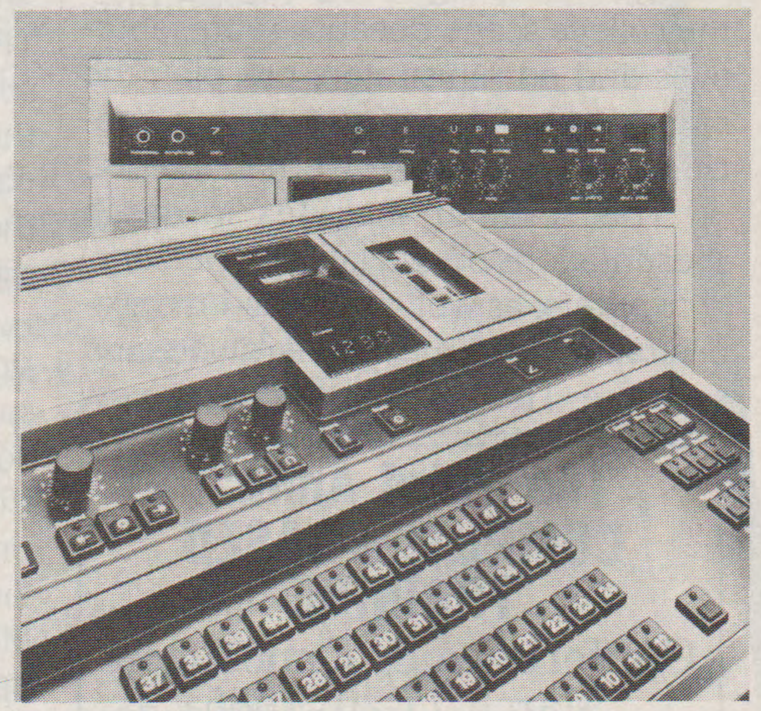
The hard-working components—the interactive teacher and student tape recorders—provide another major difference where Tandberg stands out.

For example, even our least expensive student recorders are unusually rugged, inside and out, allow simultaneous listening to master track and recording of student responses—and are completely self-contained and portable for use in independent study. No small matter when a total system may require them by the score, hundreds, or even thousands.

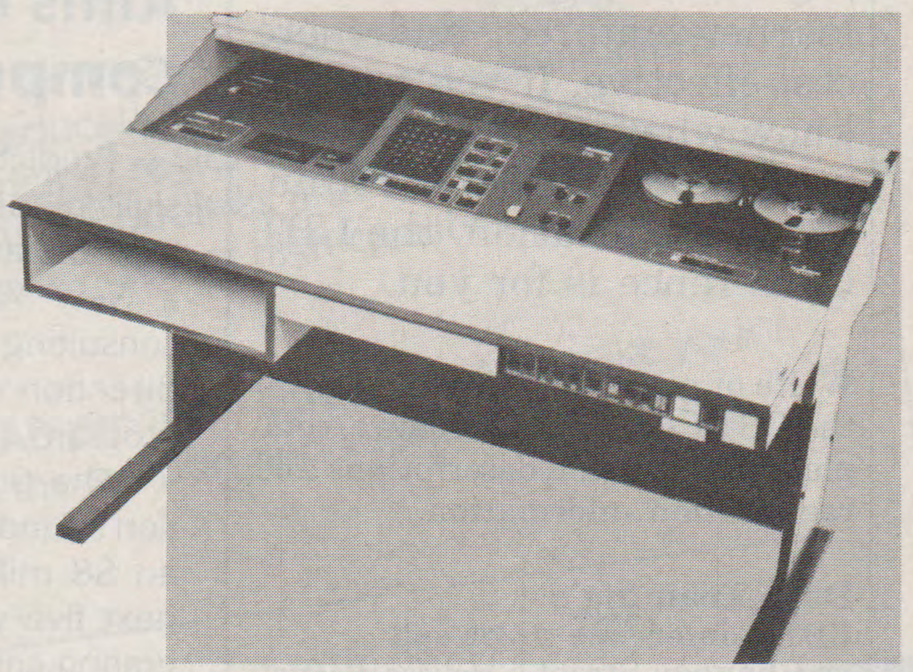
For complete information, please contact your Tandberg representative, or call us directly. Tandberg of America, Inc., 1 Labriola Court, Armonk, NY 10504. 1-800-431-2430. In New York, 914-273-9150.

*Indonesia, which invited a number of manufacturers to compete for a single order for 500 learning labs, including 20,000 student recorders.

System 100: Sophisticated low-cost system for permanent or portable applications. Master unit similar to System 500, controls up to 48 student units. Student recorders powered by battery or AC.



System 500: For permanent or portable applications. Allows any combination of master unit and up to 48 students with headsets alone or recorders with headsets. Master unit and student recorders are microprocessor-controlled.



System IS-9: Master console provides microprocessor-controlled cassette and open-reel recorders, one-step automatic program transfer, high-speed copying. Adapts for integrated two-teacher operation. Microprocessor-controlled student recorders. Programming for up to 64 students.

TANDBERG

We listen to you.

Write No. 59 on Inquiry Card

Program Tailored To Help Teach Computer Literacy

Tandy On Campus, a new program sponsored by Tandy Corporation/Radio Shack's Education Division, is designed to help people become computer literate on college campuses around the nation, according to a Radio Shack spokeswoman.

The two-day free computing seminar gives administrators, staff, faculty and students an opportunity to learn the most current information on advances in personal computing technology. The programs are unique to the college scene because representatives and administrators pre-plan the seminars to fit each university's special needs, the spokeswoman said.

The seminar includes in-depth presentations on the latest in personal computers, as well as hands-on demonstrations of computer hardware and software. The program explores new computer applications to enhance the campus population's productivity in the offices or classrooms.

Before arranging a Tandy On Campus program at a university, the company's regional educational coordinators meet with school administrators to decide on what kinds of presentations and displays would interest the campus community.

After the university's requirements are identified, the tailored Tandy On Campus program can be conducted within six to eight weeks following initial contact. The computing seminar schedule can include up to ten 50-minute presentations and participants can attend one or all of the sessions at no cost.

For the formal presentations, Radio Shack staff can set up a network of 16 TRS-80 Model 4 and Model 100 personal computers. After an overview of the microcomputer system, participants get hands-on experience using these computers in various ways with different software packages.

An Introduction to Computers session is presented during each seminar so non-computer users can feel more comfortable and at ease working with the equipment. Other tailor-made presentations might include Business Simulations, Authoring System, The Model 100, Word Processing and Spreadsheet Analysis.

Write No. 433 on Inquiry Card

Accounting Firm Aims Grants at Computer Literacy

Predicting a profound shift in the skills required of tomorrow's accountants and auditors, Coopers & Lybrand, a New York-based accounting and consulting firm, announced a new direction for its educational grant program.

The Coopers & Lybrand Foundation's funding programs, representing an $8 million commitment over the next five years, will encompass integrating computer technology into accounting curricula, providing faculty with "in-the-field" experience through internship programs, helping develop new faculty through Ph.D. grants, and contributing to business-related practical research.

Within the next five years, more large companies will be heavily networked to other company locations as well as to their banks, suppliers and customers. Peter R. Scanlon, company chairman, said he expects about 1,000 of Coopers & Lybrand's clients will be networked in this manner. "Another 4,000 clients will have large capacity main processors with some form of intra- and inter-company communications," he said. "Roughly 10,000 more clients will be using small, but powerful computers for their computing needs, with the remaining clients electronically connected to some form of outside resource such as a service bureau."

Scanlon added that in the future, his firm would be placing greater emphasis on hiring people who have the ability to apply their knowledge of computers to the business environment.

Write No. 436 on Inquiry Card

Conference to Give Perspective on '80s

With the theme, The Range of Computing: Mid-80's Perspective, the 1985 Association for Computing Machinery (ACM) Annual Conference will explore the wide range of computing technology and its impact on society. The program focuses on the 1980s—where we are and where we are going—with special emphasis on applications and pragmatics.

The conference will be held at the Denver Hilton Hotel, Denver, Colo., Oct. 14-16, 1985. Topics will include: artificial intelligence, databases, information systems, software, human issues, education, graphics, communications networks, microcomputing and super computing.

Computer professionals and students are encouraged to submit original papers, survey papers, and proposals for tutorials or panels. Papers submitted should be complete and include an abstract; proposals should include specifics of purpose, subject, and participants. Participants need not be members of ACM.

Deadline for submitting papers is Feb. 15. Papers may be submitted to Dr. Judith Schlesinger, program chair of the ACM '85 conference, P.O. Box 24102, Denver, CO 80224.

(continued on page 30)

News *(continued)*

Funds to Improve Special Education

The University of Kentucky and the Fayette County (Ky.) public school system have received a federal grant to develop ways to use microcomputers to educate handicapped children.

The Department of Education grant is for $97,283.

During the two-year project, guidelines and methods for using computers in special education will be developed. Actual implementation is expected to start with the 1985 school year.

The goal is to find ways to improve learning among the more than 3,000 special education students in Fayette County. The project also involves development of a computer training curriculum for teachers and teaching students who want to specialize in special education.

Joint Venture Opens New Computer Lab

A new computer laboratory for the School of Behavioral and Social Sciences at San Francisco State University is scheduled to open its doors next month.

This will be the second computer lab in four months to open at the university as a joint venture with the university's Division of Extended Education.

The first lab opened in October was located in the School of Business. That lab contained 30 IBM PCs linked together in an Ethernet local area network with a 3 COM hard disk file server and 30-Mbyte tape-drive backup.

The new lab will contain 16 IBM PCs, each equipped with 256-Kbyte dual drives, in addition to printers and telecommunications capabilities. There are long-range plans to link the micros together in a network, a university spokesman said.

The hardware will be supplied by the Division of Continuing Education. In exchange, the School of Behavioral and Social Sciences will provide classrooms and evening and weekend courses for continuing education students.

Write No. 410 on Inquiry Card

National SAT Scores Indicate Recent Net Gains

According to The College Entrance Examination Board (CEEB), Scholastic Aptitude Test (SAT) scores are on the rise.

Former Secretary of Education Terrell H. Bell urged governors, legislators, education leaders and parents to keep the momentum toward excellence in education alive.

"If we are to meet President Reagan's goal of regaining half the SAT losses by 1990," the secretary said, "we need to increase SAT scores by seven points a year."

In 1984, according to the CEEB, SAT combined verbal and math scores rose four points, to 897. The SAT mathematics scores rose three points and verbal scores by one point.

Although SAT scores declined throughout the 1960s and 1970s, the latest results show that:

—SAT scores increased in two of the past three years for the first time in 20 years.

—SAT scores have not declined in any of the past four years, and rose in two of them. This has not happened in any other four-year span since the current scoring system began in 1952.

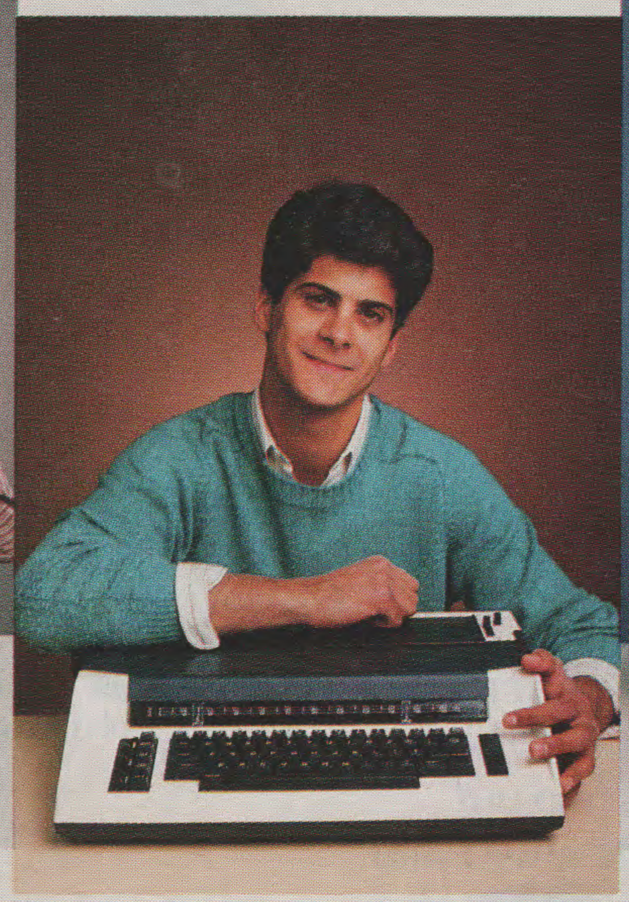
—Scores on the Standard Written English Test rose three-tenths of a point, to 42.6—the largest increase ever reported.

—College-bound seniors took more academic courses, with the biggest increase in mathematics and physical sciences, than any other graduating class since 1972, the first year CEEB reported this information.

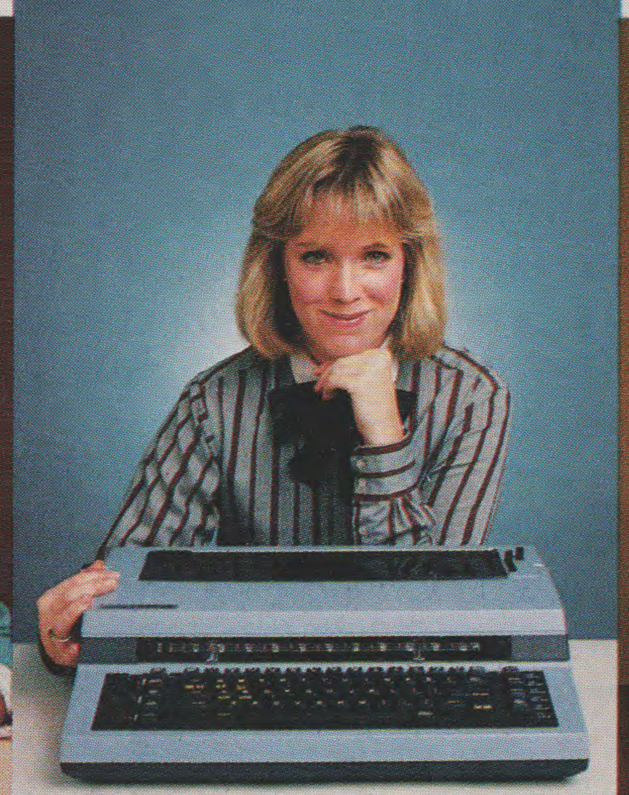
The average SAT score of intended education majors was 823 last year, still substantially less than the national average of 897. The proportion of college-bound seniors intending to major in education was 4.6 percent in 1984, up from 4.5 percent in 1983.

WHO SAYS YOU CAN'T BE ALL THINGS TO ALL PEOPLE?

Martha Simmons *of the sales department. All day, every day, she types up orders, invoices and letters that say things like, "Thank you for your inquiry; our salesman will contact you." Her* ***SWINTEC 8000 Memory*** *electronic typewriter lets her do it all with just the touch of a code key.* ***$799***



Matthew Tobin. *Works in shipping, goes to school at night. Dreams of being a best-selling author. Carries his lightweight* ***SWINTEC Collegiate*** *portable electronic to work with him and works on his novel during lunch hour. Loves the Keyboard II feature that lets him type proofreading marks right into the manuscript.* ***$399***



Liz Hastings. *Typing pool. It isn't easy handling the correspondence of three busy executives, but the* ***SWINTEC 1186CM*** *with features like Automatic Return, Automatic Centering, Automatic Indent and Automatic Decimal Tabulation certainly helps! In fact, it makes heavy duty typing almost automatic.* ***$649***

Miss Winthrop. *Executive secretary to the company president. Produces flawless communications on the* ***SWINTEC 1146CM.*** *To be honest, sometimes they just look flawless, thanks to the 1146CM's correction memory feature.* ***$549***

The Swintec Electronic Typewriter line can!

From the Collegiate portable to the sophisticated 8000 Memory, SWINTEC makes an electronic typewriter with features to meet the needs of every typist. A computer interface is standard on the 8000 Memory, and the CM models are available in computer-compatible versions, too. Whether you need one SWINTEC for personal typing or several dozen to equip your offices, you'll find that the SWINTEC line of electronic typewriters is, feature-for-feature, the lowest-priced on the market.

See them at your SWINTEC dealer, or return the coupon for more information.

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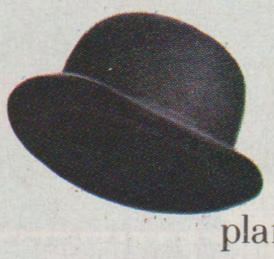

Write lesson
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Teacher's aid:

You became a teacher because you wanted to teach. But now you find too much of your time consumed by less creative obligations.

An IBM PC*jr* can lighten your load considerably, by helping you do many things a lot more quickly with a lot less effort.

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Take routine tasks, like keeping track of attendance and grades. With the help of programs in the IBM Assistant Series, you can store, format or automatically print out the information you need, quickly and efficiently.

You can make shorter work of less routine jobs, too. Using an IBM word-processing program can help you save time writing lesson plans. Preparing quizzes will go faster as well, with the help of software like IBM Teacher's Quiz Designer.

More time for essentials

The whole point is for you to have more time to spend with individual students. More time to introduce new ideas. In short, more time to teach.

Time counts in another way, too. During this school year, a special PC*jr* discount is available to accredited, nonprofit educational institutions and their full-time faculty and staff. For example, with the discount, a system including an enhanced PC*jr* and an IBM PC*jr* Color Display can be purchased for $950—40% off the retail price.* And there are further discounts for quantity purchases.

To place an order or to learn more about our computer education programs, just call the IBM Education Information line at 1-800-IBM-2468. In Alaska and Hawaii, 1-800-526-2484.

*IBM Product Center price

Write No. 36 on Inquiry Card

IBM®

Software & Courseware

Keyboard Training Improves Accuracy

With the release of its AccuTouch MacIntosh, Keyboard Productivity Inc. (KPI) now offers this keyboard training program for the entire line of Apple computers. The company has also customized the software for the IBM PC and 13 other personal computer models manufactured by eight computer firms.

AccuTouch is a self-paced system incorporating the results of the company's 20 years' experience in keyboard training for industry, a KPI spokesman said.

The training program is contained on floppy disks and comes with a 56-page, four-color training manual, keyboard charts and progress forms. The system automatically measures and retains the student's level of achievement in speed and accuracy. *Keyboard Productivity, Inc., Marina del Rey, CA.*

Write No. 209 on Inquiry Card

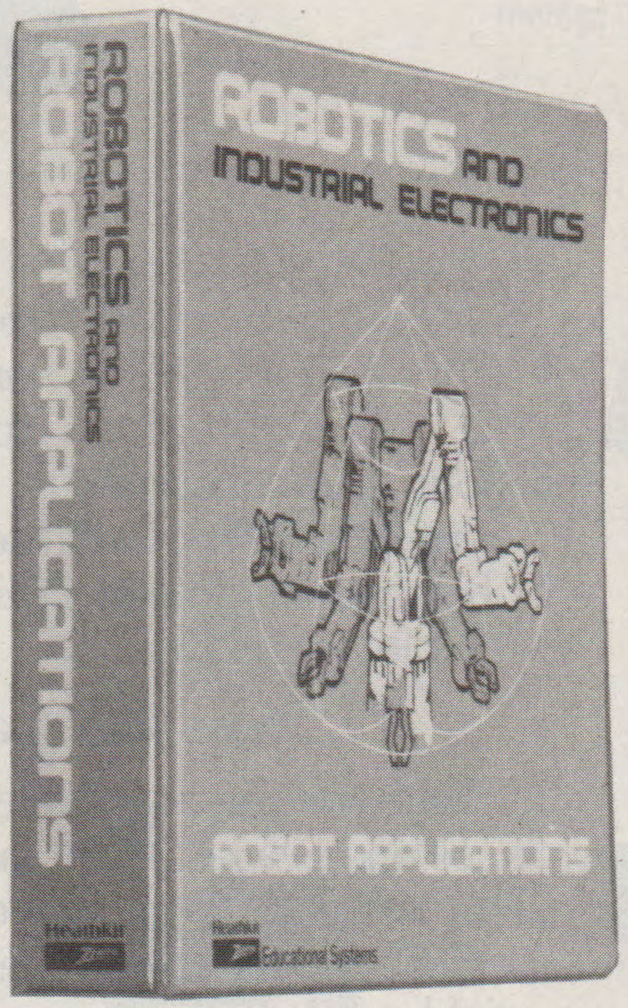
Course Details Robotics in Industry

A new Robot Applications course designed to teach the concepts and technologies that are shaping today's industry is now available from Heathkit/Zenith Educational Systems.

The course briefly reviews the basic concepts of robotics and then introduces new ideas and technologies. Factors which govern the selection of an industrial robot (tasks involved, payback, reliability, quality) are covered with emphasis given to different types of vision, tactile and environmental feedback sensor systems.

The course also covers present and future robot applications, computer-aided manufacturing (CAM) and nine hands-on course experiments which can be performed using HERO I, the Heath Education Training Robot. These experiments include constructing a variety of sensor systems.

The classroom version consists of a student text, a student workbook, an instructor's guide and a parts kit. A self-instructional version also is available.



FEATURES ROBOT EXPERIMENTS

The Heathkit/Zenith Educational Systems' Robotics and Industrial Electronics Course is recommended as a prerequisite to the Robot Applications course. *Heath Co., Benton Harbor, MI.*

Write No. 241 on Inquiry Card

Micros Make Slides For Presentations

A new graphics presentations package for the IBM PC and capatibles offers free-form drawing, administrative or classroom graphics, eight different font styles, nine colors, the ability to create animated presentations, and customizable slide shows with logic and viewer interaction.

CUSTOMIZES SLIDE SHOWS

Called Executive Picture Show, the package currently runs on the IBM PC and IBM compatibles and will soon be available for the Burroughs ET2000 graphics workstation. System requirements for Executive Picture Show include 92 Kbytes (256 Kbytes on compatibles), two double-sided disk drives or a hard disk, and an IBM compatible graphics card.

PCsoftware, manufacturers of the product, are offering a trade-in discount for owners of their earlier product, PCcrayon. *PCsoftware, San Diego, CA.*

Write No. 213 on Inquiry Card

Lessons Developed On IBM PC Line

Computer Teaching Corp. has released a set of software tools for developing computer-based training materials on the IBM Personal Computer line, including the PCjr. Company President Paul Tenczar, creator of the TUTOR language used on the PLATO system, said the TenCore Language System provides features previously available only on dedicated teaching systems or large mainframes.

PROGRAMMING COURSEWARE ON IBM PC

The TenCore Language System provides a flexible authoring language and integrated development tools that include source, graphics, and character-set editors. It also supports full-color graphics or monochrome display, a mouse and light pen, and comes with an external device interface.

Additional features of TenCore include user-definable character sets, an on-line language reference system, student rostering and recordkeeping capabilities, and an optional Computer-Managed Instruction Package. Quantity and educational discounts are available. *Computer Teaching Corp., Champaign, IL.*

Write No. 221 on Inquiry Card

Telecommunications For Micros, Minis

Hayes Microcomputer Products has released Smartcom II 2.0 telecommunications software, which works on both the new IBM PC AT and the AT&T 6300 Personal Computer. Upgrades are available for earlier versions of Smartcom II, which do not work on either computer.

Smartcom II 2.0, also available for the TI Professional, Wang PC, HP 150 and the DEC Rainbow 100, offers both the Hayes Verification protocol and the XMODEM public-domain protocol to insure error-free transmission. VT52 and VT 102/100 emulation is another feature of the upgrade.

A Batch Command Set directory is included for storing up to 26 command sequences that allow users to automatically send and receive files at preset times. In addition, users can switch between voice and data transmission. *Hayes Microcomputer Products, Inc., Norcross, GA.*

Write No. 204 on Inquiry Card

Authoring System Provides Options

The Regency Courseware Generator (RCG) package allows for creation of courseware by lesson designers with little programming experience, according to the publishers. Rather than forcing the designer to learn elaborate display code, the RCG uses a display editor similar to the one in the USE authoring language.

An author using the RCG can create pictures and position text by moving a cursor around the screen and then pressing the appropriate graphic key or entering the text.

A course can consist of any number of frames that can include one or more different types of lesson material, such as: information presentation; multiple-choice or matching questions; a "touch" frame allowing students to respond by touching the screen; and a "flexible answer" or "fill-in-the-blank" frame for which the author can specify correct synonyms, ignorable words or feedback for incorrect answers.

Direct branching within an RCG course also is provided and can be based on a variety of criteria. *Regency Systems, Inc., Champaign, IL.*

Write No. 220 on Inquiry Card

(continued on page 36)

IBM Expands PC Software Support Center

The IBM Personal Computer Software Support Center, which provides technical assistance on IBM PC software products, has been expanded and is now available on an annual subscription basis.

The center began as a pilot program in January 1984. Its services now include technical assistance on 35 IBM PC software programs, and a monthly newsletter with tips and techniques, information on new products and in-depth technical articles, a company spokesman said.

For a $40 one-year membership fee, subscribers receive the newsletter and may call the center on a fee basis for information about using a program's features and functions, as well as in-depth assistance with programming and technical aspects of the product. Subscribers pay an additional $40 for one or more phone calls to answer a specific question.

Write No. 405 on Inquiry Card

Software *(continued)*

Crash Course Shows Computer Graphics

An in-depth study of the computer graphics field, including aspects of its development, major trends, various systems, applications and historical background, is offered in a 60-minute videocassette titled Creative Computer Graphics.

The Tutorial segment is introduced by the development of chalice models from wire frame to hidden line to solid modeling—and further with faceted surfaces, smooth shading and texture mapping.

System Survey, the third part, looks at equipment used in the creation of computer graphics, including systems for color mixing, airbrushing and animation. Real use of computer graphics is shown in Applications, the last segment.

Described by its publishers as a "crash course" in computer graphics, the Creative Computer Graphics videocassette is available in U-Matic, VHS and Beta formats. *Computer Pictures, New York, NY.*

Write No. 280 on Inquiry Card

Multi-Lingual Input Provided for Text

Foreign language educators can now use Apple computers to teach foreign languages with The Professor's multi-lingual computer programs. Each program allows for the entry of text in Spanish, French, German, Danish/Norwegian, Finnish/Swedish, Hawaiian, Hungarian, Italian, Latin/Dutch, Polish, Portuguese, Turkish and Czech.

The Great Creator is a multi-lingual multiple-choice, true/false and fill-in-the-blank questionnaire generator.

Multi-Lingual Language Teacher includes a library of drawings in color as an aid for teaching foreign languages. This program allows educators to create and operate their own programs for computer language instruction.

The publishers also offer Multi-Lingual Criss-Cross Word, Multi-Lingual Word Maze and Multi-Lingual Word Game. *The Professor, Ft. Lauderdale, FL.*

Write No. 217 on Inquiry Card

New Communication Package for IBMs

PC Pipeline is a terminal communications package offered by Transend Corp. for the IBM PC. It supports many MS-DOS commands so that the user does not have to exit Pipeline to perform them. For example, PC Pipeline allows the user to print, rename or erase a file.

The number of phone numbers that can be stored is limited only by the size of the available disk, according to a Transend spokesperson. Each phone number can be 40 characters long and can be assigned 20 keyboard macros. PC Pipeline offers auto dial and auto logon capability.

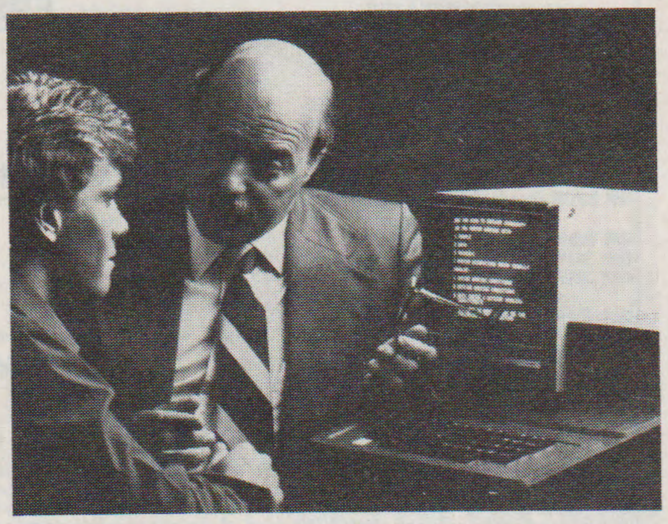
File functions available include an Instant Peek feature. While on-line, the user can peek at the first 16 lines of a file to be sent, to be sure it is the correct file. Messages from different disks can be merged with PC Pipeline. In addition, an optional electronic mail upgrade is available. *Transend Corp., San Jose, CA.*

Write No. 247 on Inquiry Card

Diskettes Access Careers Database

Up-to-date career information on a microcomputer is provided by Bell & Howell's Multiple Disk System, which provides access to the company's Coordinated Occupational Information Network (COIN).

Compatible with Apple II and TRS-80 computers, the programs included in the Multiple Disk System



ON-LINE CAREER CHOICES

offer access to COIN's six career files: Occupations; School Subjects; College Majors; Two- and Four-year School File; Apprenticeships, and Military Occupations.

Designed for students, teachers, guidance counselors and job placement personnel, COIN provides data on education/training requirements, course curriculums, job markets, salaries, working conditions, financial aid programs, scholarships, trade apprenticeships and projected employment outlooks.

Step-by-step instructions are incorporated in each program, so students need no special training or counselor assistance to utilize them, a Bell & Howell spokesman said. The Multiple Disk System is available complete or in separate files—to suit individual needs and budgets. *Bell & Howell Micro Photo Division, Wooster, OH.*

Write No. 219 on Inquiry Card

Virtual Networking Boosts Capabilities

Novell, Inc.'s Virtual Network 5.0 is based on a global networking concept which is said to overcome the traditional limitations of microcomputer networks. Its capability makes both storage capacity and the number of microcomputers which may be networked theoretically limitless, and network performance near perfectly linear, a Novell spokesman said.

Virtual Networking incorporates four features: Multiple Servers, allowing more than one file server to be attached to any of the network topologies supported by the NetWare Operating System; Job Queing, a method of making the local resources of any idle workstation available to all other users; Network Communications Bridges, which allow networks of both the same and different topologies using NetWare to communicate with each other; and Network Communication Gateways, making it possible for a workstation to communicate with a system not using NetWare.

Virtual NetWare 5.0 will support IBM's PC Cluster Network. All of Novell's NetWare products utilize the NetWare Operating System, which now provides increased file server capability to LANs that include Corvus' Omninet, Nestar's Plan 2000, SMC's Arcnet, and Novell's own NetWare/S. *Novell, Inc., Orem, UT.*

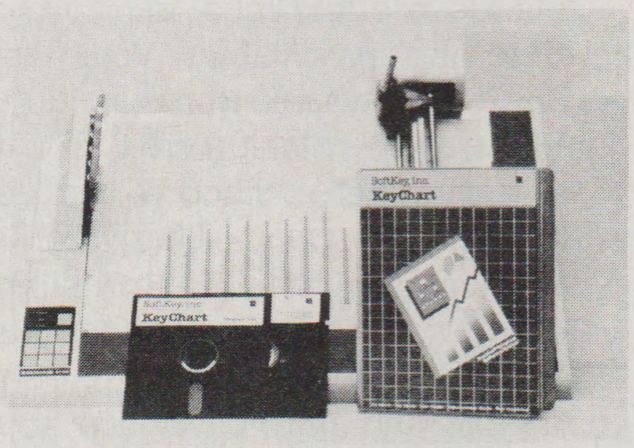
Write No. 269 on Inquiry Card

(continued on page 38)

Plotter Comes With Software

Keychart, a new presentation graphics package by SoftKey, Inc., is being provided to purchasers of the Western Graphtex six-pen MP1000 plotter, according to company spokesmen.

In addition to functioning as a stand-alone package, Keychart can access and read files from popular electronic spreadsheet programs to produce a variety of sophisticated charts on the MP1000, spokesmen said. Spreadsheet programs that will work with Keychart include Lotus 1-2-3, SuperCalc, VisiCalc and MultiPlan.



SOFTWARE FOR GRAPHICS

The MP1000 plotter is designed for IBM PC and compatible computers. The Keychart Software also is available for other MS-DOS and CP/M operating systems in a variety of disk formats, including those of Texas Instruments Professional Computer, Zenith Z-100, Epson QX10, Kaypro and Eagle. *SoftKey Software Products, Inc., Santa Clara, CA.*

Write No. 282 on Inquiry Card

Package Lets Users Cut, Paste Graphics

A new utility package featuring printout, slide show, and cut-and-paste capabilities has been introduced by Koala Technologies Corp. It runs on all Apple II personal computers, including the new IIc.

Called Graphics Exhibitor, the utility package interfaces with the company's KoalaPad Touch Tablet and KoalaPrinter design software.

Users draw images on the screen by touching a stylus or finger to the KoalaPad; these pictures can be stored on disk for later retrieval. The Graphics Exhibitor allows sections to be cut from these retrieved drawings for immediate printout, stored separately for later use in a slide show or saved for later pasting into an assemblage of images. *Koala Technologies Corp., Santa Clara, CA.*

Write No. 283 on Inquiry Card

Short Stories Live In Video Series

Film versions of 17 short stories by American authors are available on ½" or ¾" videocassettes for classroom and media center use. Each of the 17 videocassettes is available separately.

Stories in The American Short Story Video Series include: The Jilting of Granny Weatherall, by Katherine Anne Porter; Barn Burning, by William Faulkner; Paul's Case, by Willa Cather; The Blue Hotel, by Stephan Crane; and The Displaced Person, by Flannery O'Connor.

Available separately as an instructional supplement is The American Short Story in Paperback, Volumes 1 and 2. These volumes include all 17 stories, critical essays, complete screenplays and screenplay excerpts, interviews with writers and directors, bibliographies and photos. *Coronet, Deerfield, IL.*

Write No. 256 on Inquiry Card

Dinosaur Lessons Include Graphics

Designed for elementary children, Dinosaur Days is a full-color tutorial, with graphics and animation, which teaches about dinosaurs and their environment. Topics covered on two disks of text and animated pictures include: fossils and their value in studying dinosaur history, differences among dinosaurs, and profiles of several favorites such as Tyrannosaurus as well as lesser-known dinosaurs.

The program concludes by listing several theories concerning the extinction of the dinosaurs. Each disk contains a short graded test and an opportunity to review the material.

Written for the Apple II family of computers running under DOS 3.3, Dinosaur Days includes a user manual with worksheets and suggestions for additional classroom activities. *Teach Yourself By Computer Software, Inc., Pittsford, NY.*

Write No. 272 on Inquiry Card

(continued on page 38)

Software *(continued)*

Cassettes Introduce Specific Computers

A new series of 90- to 120-minute videocassette computer training programs, called CompuTutor, is intended for persons who wish to acquire machine-specific computer operation skill.

CompuTutor takes the novice or experienced user through a step-by-step process of learning how to use some of the most popular microcomputers, as well as popular software application programs.

According to the publishers, features that distinguish CompuTutor from other tutorials include plain language instruction, machine-specific training, and real-time exercises. In addition, actual demonstration businesses and business situations are said to allow the user to learn how everyday business problems may be solved through the use of specific computer software programs.

CompuTutor consists of a VHS or Beta series of four programs each for the Apple IIe, IBM PC, TRS-80 Model 4, and numerous compatibles. *Embassy Communications, Inc., Los Angeles, CA.*

Write No. 238 on Inquiry Card

Animation Depicts Flower's Anatomy

The Flower uses colorful computer graphics and animations to teach advanced high school and college students about the structure and function of flowers. Major categories of flowers are explored, along with less common variations in anatomy.

Students are encouraged to explore and to answer their own questions with lesson features such as a glossary of terms, frequent questions with remediation, extra "Details" screens, and sophisticated lesson branching.

A low-cost optional disk allows this Apple II lesson to record and manage student scores. The Flower is compatible with the publisher's authoring system, Super Sofcrates: The Courseware Creator. *Simpac Educational Systems, Gainesville, FL.*

Write No. 215 on Inquiry Card

Some People Have Auditory Memories

Although most people have visual memories for spelling words, a few have auditory memories; they "hear" spelling words in their minds and spell them like they "hear" them. So say the publishers of Spell-A-Vision, designed to help a person with an auditory memory develop a visual memory so he "sees" spelling words in his mind.

Spell-A-Vision is an independent study program requiring no teacher or parent guidance. Each of its 8,000 words has a sentence which communicates the word's meaning.

Words are grouped in rhyming families and by syllables. Volumes 1 and 2 are one-syllable words; Volumes 3 and 4 are two-syllable words; Volume 5 asks students to choose between two words that sound alike; Volumes 6 and 7 are polysyllabic words; and Volume 8 has "spelling demons." Versions are available for Apple II, Commodore 64 and IBM-PC microcomputers. *Cross Educational Software, Ruston, LA.*

Write No. 237 on Inquiry Card

Program Maintains Attendance, Grades

Class Records by Educational Systems software is a system for recording and reporting both attendance and grades on Apple computers. It can combine with other disks to transfer grades from separate exercises or test modules to the main grade book.

Attendance records can be printed or shown on the screen either by class for a particular day, or by individual student for an entire grading period.

The grading portion of the program uses the same class list as the attendance portion. Grading categories such as tests, daily work, reports or lab exercises can be added or deleted at any time, and grades can be automatically converted to a curve.

Class Records uses a master disk to start the program and a separate data disk for student records for each class taught. A documentation manual is included. *Educational Systems Software, El Toro, CA.*

Write No. 208 on Inquiry Card

(continued on page 40)

"Mr. Chips™ Brings Our IBM® PC To Life"

Jim Reedy, Vice President
Reedy Robotronic Productions, Inc.
Van Nuys, California

The First Multi-function Card for the Real World

At Reedy Robotronic Productions, bringing ideas to life is a way of business. With an IBM PC and Mr. Chips, the new multi-function card from Orange Micro, complex robotic machines virtually come alive.

"Mr. Chips provides the link between our IBM PC and the devices we use to develop our applications," says Jim Reedy, Vice President. "With an on-board interface that accepts direct digital timing data and a port for the measurement of variable resistive inputs, Mr. Chips allows us to program our robots to become top performers—animated characters that sing and dance in precisely synchronized sound and motion."

It's Possible Because Mr. Chips is No Ordinary Multi-Function Card. You can now open up a whole new world of applications with these innovative Mr. Chips features:

- Real World Interface*: Using an Intel® 8255 Programmable Peripheral Interface, this fully addressable twelve bit port provides an eight bit bidirectional TTL bus and four bits of programmable output.
- Dual Game Port*: Besides serving as a standard game paddle interface, this unique port also permits monitoring of four variable resistive inputs (up to 100K Ohms each) and four digital inputs. Combined with the Real World features, you can also interface your PC to many popular general purpose instruments.
- BSR™ AC Line Controller*: This interface will send coded ultrasonic signals to your BSR X-10 unit, allowing control of up to 16 AC devices. It can also be set up for responses to Real World Interface input or data from the clock/calendar to provide a complete control system.

And of course Mr. Chips also provides the features you expect on any quality multi-function card. Like memory expandable from 64K to 256K, a clock/calendar to keep track of time and date, and a parallel and serial port for communication with peripheral devices. Also included is Chipdisk™ software for configuring your PC's memory into a RAM Disk for efficient program execution and a Print Spooler for printer buffering.

These standard features provide everything you need to put your PC to work. Whether you're developing laboratory, engineering or home control applications, or even timing the beat of Barney the Bear's drum roll, Mr. Chips provides the capabilities you need at a remarkably low price. See your dealer today, or call Orange Micro for one near you. Mr. Chips, the multi-function card that puts real world power in your PC.

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Write No. 15 on Inquiry Card

Software *(continued)*

Adventure Gaming is Applied to History

U.S Adventure applies the principles of adventure gaming to an interactive trip around the United States

PLAYERS TRAVELS THROUGH TIME

and through time. Players learn about American history, geography, presidents, trivia, and states and capitals while scoring points and filling in map screens.

In addition to a high-res graphics time tunnel, the software features selectable levels of difficulty, choice of four-key keyboard or joystick control, and a save-game option.

Designed for pre-teens and high schoolers, U.S. Adventure offers worksheets and maps to fill in. A Teacher's Classroom Guide also is available. The program is offered for Apple II's, IBM PC and PCjr, Commodore 64 and Atari computers. *First Star Software, Inc. New York, NY.*

Write No. 239 on Inquiry Card

Equation Processor Gets Mac Version

TK!Solver equation processor from Software Arts is now available for the Macintosh. This new version is designed to take advantage of Mac capabilities.

Users enter knowledge in the form of equations, tables and formulas in a language natural to them, and TK!Solver then uses this information to solve problems, a Software Arts spokesman explained.

The Mac version of TK!Solver includes several enhancements based on Mac features. It uses the mouse as an integral pointing device, performs high-resolution plotting, provides answers with 12-digit precision, and recognizes numbers with absolute values as small as 1E-300 and as big as 1E300. In addition, it uses Mac windowing to provide error diagnosis that remains on the screen while the user makes corrections.

Users also have full access to the Mac's desk accessories and can cut and paste between applications. *Software Arts, New York, NY.*

Write No. 214 on Inquiry Card

English Text is Switched to Speech

Text-to-Speech:65 is a real time text-to-speech translation program for the SSi-263 synthesizer. It translates unrestricted English text, generated by a program or typed from the computer's keyboard, directly into speech.

Text-to-Speech:65 is compatible with the Sonix:65 Speech Operating System and Phonetic Speech Editor. It can be accessed from BASIC or other languages. The software will work with the SynPhonix 100 speech synthesizer on the Apple II computer or other 6502-based, SSi-263-compatible products.

Frequently used words that are mispronounced by the translator can be manually programmed and stored in user-defined Exception Tables, which will override the translation rules. *Artic Technologies, Auburn Heights, MI.*

Write No. 225 on Inquiry Card

Course Introduces PC Business Uses

A self-study course titled The IBM PC as a Business Tool provides first-time users with training on basic computer concepts, hardware, software, DOS capabilities, data protection, communications and major PC business applications.

The five major applications addressed are spreadsheets, business graphics, word processing, databases, and accounting applications. All these areas are taught with working software packages that are designed to illustrate general characteristics of popular software products. The student is able to build a spreadsheet

COVERS FIVE APPLICATIONS

and graph it, create an address database, write a letter and merge it with the database, and learn about accounting applications.

The first release in the MasterKey series from Automated Training Systems, The IBM PC as a Business Tool includes a set of diskettes containing the working software, audio cassette tapes and a study guide with learning materials. *Automated Training Systems, Woodland Hills, CA.*

Write No. 227 on Inquiry Card

Consulting Service For Computer Use

Edu-Comp has announced consulting services to aid schools and school systems utilize computers in classrooms and administration. Objectives of the consulting services are: to raise computer literacy of teachers and administrators; to enhance curricula to better utilize computers in the learning process; and to increase productivity of instructional staff in daily preparation of classroom activities, record processing and student evaluation.

Additional objectives include preparing students for career opportunities in high-technology jobs and increasing productivity of administrative staff through word processing, computer scheduling and other management functions.

Services provided include customized, ongoing inservice activities; developing custom materials for use by teachers and administrators; and providing technical consulting services in the evaluation of potential computer hardware and software purchases. *Edu-Comp, West Bloomfield, MI.*

Write No. 242 on Inquiry Card

(continued on page 47)

Radio Shack Educational Software Catalog 1985

Radio Shack's Commitment to Education

A Wide Selection of Field-Tested Programs

Radio Shack involves the experts—teachers, curriculum developers and administrators—in designing and field-testing our complete line of TRS-80® courseware. Compare our courseware with other programs currently available. You'll see what a difference a commitment to quality can make.

We Meet Your Total Classroom Computing Nee

Radio Shack's TRS-80 microcomputer is a valuable teach tool widely used in schools nationwide. We have a ma commitment to support educational uses of the TRS-80 producing a growing list of instructionally-sound coursew We provide training and support, including free comp training classes, courseware manuals designed for educa who have never worked with a computer, and 26 Regi Educational Coordinators.

Radio Shack TRS-80 Classroom Courseware

Children's Computer Workshop

Designed by the CTW Software Group, a division of Children's Television Workshop, these two packages are for use with first and second graders. Each requires a TRS-80 Color Computer disk system and includes diskettes, teacher's guide, game boards, posters, spirit masters and activity cards.

Play-With-Language™ (Cat. No. 26-2538, $99) consists of three word and reading activities to teach sight and vocabulary words, decoding and comprehension skills. **Hands On!**™ (Cat. No. 26-2639, $99) lets students write with beginning word processing aids and create and manipulate pictures in ways unique to computer art.

New! Classroom Courseware from MECC

Ten popular programs developed by the Minnesota Educational Computing Corporation. Many include a manual containing learning objectives, lesson plans, student exercises and worksheets. Choose **Basic Arithmetic** (26-2790, $44.95), **Word Games** (26-2791, $44.95), **Expeditions** (26-2792, $44.95), **Puzzles and Posters** (26-2793, $44.95), **Graphing** (26-2794, $34.95), **Music** (26-2795, $34.95), **Pre-Reading** (26-2796, $34.95), **Earth Science** (26-2797, $34.95), **Marketplace** (26-2798, $34.95) and **Outdoor Biology** (26-2799, $34.95). MECC programs 26-2790 thru 26-2793 require a 48K Model III or Model 4 disk system. Programs 26-2794 thru 26-2799 require a Color Computer with 32K Extended Color Basic.

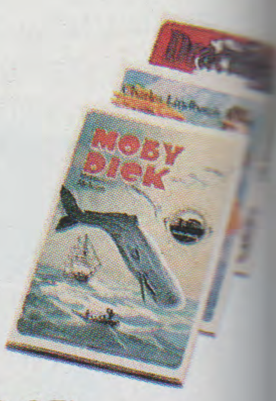
Computer Assisted Reading Development

Adapted from the successful Philadelphia Computer Assisted Reading Development Program for students with reading problems at the 4 to 8-grade level . TRS-80 AUTHOR I Lesson Presentation Package (26-2707) or TRS-80 AUTHOR I (26-1727) and a Model III or Model 4 disk system are required. Network 3 compatible using the TRS-80 Network 3 AUTHOR I Lesson Presentation Package (26-2713).

Choose from **C.A.R.D. I: Sentences** (*26-2603, $19 **C.A.R.D. II: Paragraphs** (*26-2604, $199) or **C.A.R.D. Directions** (*26-2605, $199.00).

Reading Series

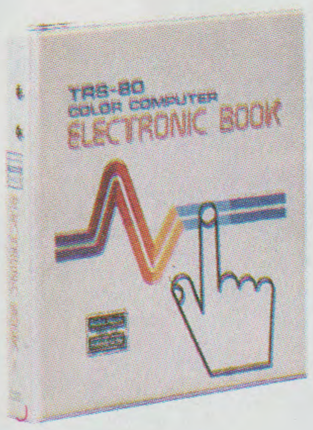
The programs in our **High Motivation Reading Series** are written for grade levels 4–6. With four student readers and a read-along audio tape. Require a Model III or Model 4 disk system and TRS-80 MicroPILOT™ (26-2718).



Select **Charles Lindbergh/Amelia Earhart** (*26-2513, $74.95), **The Hound of the Baskervilles** (*26-2514, $69.95), **Dracula** (*26-2515, $69.95), **Moby Dick** (*26-2516, $69.95), **The Beatles** (*26-2517, $69.95), **20,000 Leagues Under the Sea** (*26-2518, $69.95), **Time Machine** (*26-2519, $59.95), **Frankenstein** (*26-2520, $59.95), and **HMRS Student Records System** (26-2521, $29.95).

Introduction to the Alphabet (*26-1718, $39.95) helps 4 6 year-olds learn the alphabet and computer keyboard. Av able on cassette or disk for Model III or 4.

Hall of the Mountain King (*26-2616, $39.95) action ga Classroom version lets students answer any multiple-cho quiz as they play. Requires Model III, or Model 4 disk sys or 16K with cassette. Network 2 compatible.



Learning is Fun and Easy With Our Electronic Book

Our (26-3141, $24.95) makes learning fun. Different areas of the book's touch-sensitive surface are pressed to interact with the computer as the child makes activity selection or answers question. Each of the software packages contain software and colorful pages which are inserted into the Electronic Book. Each program teaches different concepts. Plugs into j stick port. Requires 16K. Select from these six diffe packages: **Professor Pressnote's Music Machine** (26-25 $24.95), **Solar Explorer** (26-2546, $19.95), **Word Wiz** (26-2544, $19.95), **Shape Maker** (26-2542, $19.9 **Maze Master** (26-2541, $19.95) and **The Number Fact** (26-2543, $19.95).

Model III Courseware Will Run on a Model 4 in Model III M
***Network 3 compa**

Colorful Programming Languages For Learning

Our **Color LOGO** helps students grasp fundamental programming concepts. Through manipulation of a "turtle" on the screen, students learn to program and gain valuable insight into advanced mathematical, geometric and logical concepts. In addition, Color LOGO is versatile. Children under reading age can use Color LOGO's "doodle" mode to create their own graphics using one-key commands. For older children, Color LOGO features a "hatch" command which allows creation of multiple turtles that are capable of running separate programs simultaneously. Our **Disk Color LOGO** (26-2721, $99) requires a 32K Extended BASIC Color Computer and disk drive. The **Program Pak™ Color LOGO** (26-2722, $49.95) requires a Standard BASIC Color Computer. Use your own TV with either version.

Our **Color LOGO Teacher's Book** (26-2761, $3.95) gives you instructional ideas and activities for presenting LOGO in the classroom.

The **Color LOGO Parent's Book** (26-2763, $3.95) is designed for parents and kids to learn LOGO together.

Color LOGO Lab (26-2770, $199) provides a complete guide for teaching Color LOGO. **Additional Student Workbooks** (26-2771, $2 each) are available.

Our SUPER LOGO is an expanded version of Color LOGO. You get all the features of Color LOGO plus list processing capabilities, decimal arithmetic and more flexibility in the immediate use mode. **Disk SUPER LOGO** (26-2716, $99) requires a 32K Extended BASIC Color Computer and disk drive. The **Program Pak SUPER LOGO** (26-2717, $49.95) requires a Standard BASIC Color Computer. Use your own TV with either. **SUPER LOGO** (26-2738, $299) is compatible with Network 2.

DR Logo offers beginners and advanced students a powerful way to draw pictures, create intricate graphics designs, play word games, chart figures and more. Features include split screen debugging, list processing capabilities, on-line help and upper and lower case characters. An easy-to-follow tutorial lets first-time users begin writing programs quickly. Model III or Model 4 **DR Logo** (26-2781, $99.95) requires 64K. Tandy 2000 **DR Logo** (26-2782, $125) requires 256K, high-resolution monitor recommended. Model 1000 **DR Logo** (26-2783, $125) requires 256K.

Radio Shack Makes Courseware Development Easy

Our authoring systems make it easy to create courseware. No programming knowledge is required. Each program requires a Model III or Model 4 disk system.

TRS-80 AUTHOR I (26-1727, $149.95) is a screen-oriented authoring system. Sample lesson included.

TRS-80 AUTHOR I Lesson Presentation Package (26-2707, $64.95) presents lessons created using TRS-80 AUTHOR I. (Not required if you have TRS-80 AUTHOR I).

Courseware Development with AUTHOR I (26-2697, $350) helps educators design their own lessons.
Courseware Development Student Manual (26-2698, $4.95).

TRS-80 Network 3 AUTHOR I Lesson Presentation Package (26-2713, $299) allows the Network 3 Controller to present lessons created with TRS-80 AUTHOR I. Requires host computer with two disk drives.

TRS-80 MicroPILOT™ (26-2718, $119.95) is a command-oriented language that lets you create your own courseware or adapt it from any curriculum suitable for computer assisted instruction. Based on the PILOT computer language, but offers extended graphics and handling capabilities. Requires a Model III or Model 4 disk system.

Color PILOT lets you mix text and high-resolution graphics. It features a line editor and easy one-letter commands. **Disk Color PILOT** (26-2710, $79.95) requires an Extended BASIC Color Computer with disk drive. **Tape Color PILOT** (26-2709, $59.95) requires a Standard BASIC Color Computer. Use your own TV with either.

Quick Quiz: A Mini-Authoring System (26-1728, $39.95) makes it easy to create, store, and give multiple-choice tests. Type up to 40 questions with four answer choices per question. Scores can be printed or stored on disk. Requires a Model III or Model 4 disk system.

Game Writer (26-2572, $44.95) is a unique programming language for creating programs that draw pictures, produce sounds and make shapes move about the screen. Requires a 32K Color Computer disk system.

Helpful TRS-80 Educational Resource Materials

The third edition of our **TRS-80 Educational Software Sourcebook** (26-2712, $9.95) is a complete guide for educational courseware for TRS-80 computers. It contains over 1800 vendor-furnished listings of programs classified under 14 subject areas. Each listing gives program content, grade level, instructional technique used, and hardware required. Many contain user-site references. Also includes publisher profiles.

My TRS-80 Likes Me (26-2751, $2.50) is a teacher's guide to helping elementary students understand BASIC.

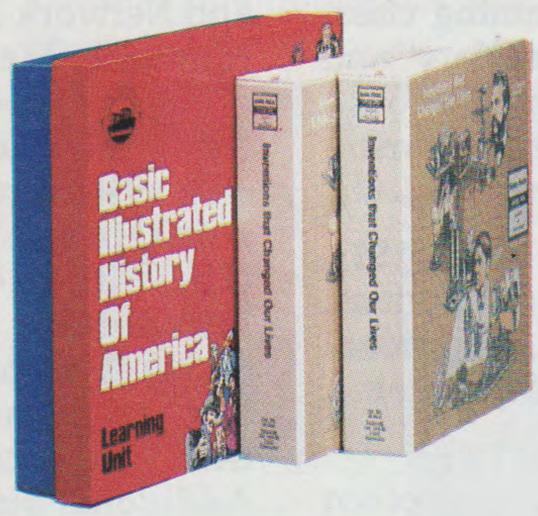
The **TRS-80 Microcomputer Information Handbook for Educators** (26-2757, $2.50) describes what microcomputers and courseware are, and how they can be used.

Radio Shack's Proposal Writing Guide (26-2754, $9.95) is a guide for educators who want to write proposals for funding from an outside source for computer-related education projects.

Number Patterns (26-2752, $2.50) shows how to introduce sequences and series using computers.

History and Social Studies Courseware Packages

Basic Illustrated History of America Learning Unit (26-2645, $299) includes twelve illustrated books on American history—from 1500 to the 1980's. TRS-80 AUTHOR I Lesson Presentation Package (26-2707) or TRS-80 AUTHOR I (26-1727), and a Model III or 4 disk system required. Network 3 compatible using 26-2713.
Our two **History of Technology** packages use colorful graphics, text, sound effects and recorded speech. Requires 16K Color Computer, TV and cassette recorder.



Pioneers in Technology (26-2624, $94.95) includes The Age of Flight, Space Exploration, and History of Computers. **Inventions That Changed Our Lives** (26-2625, $94.95) includes Edison's Electric Inventions, Bell and the Telephone, and The Age of Television.

The Next Four Years: Electing the President (26-2664, $19.95) helps students study and understand the American election process. A 32K Model III is required.

Challenging Math and Science Courseware

K-8 Math Series of programs supplements regular classroom math instruction in kindergarten through eighth grades. Include summaries and a K-8 Math Cross-Reference

The **K-8 Math Program, Vol. I** (*26-1715, $199) provides random drill and practice problems in number concepts and basics. A Model III or Model 4 cassette system is required.

The **K-8 Math with Student Management, Vol. I** (*26-1725, $199) combines the K-8 program with a student management capability. A Model III or Model 4 disk system is required. Printer is optional.

Our **Color Math** (26-3202, $39.95) automatically places students in lessons at their skill level. A Color Computer with a 32K disk or 16K cassette system is required. Network 2 compatible.

The **K-8 Math Worksheet Generator** (26-2162, $99.95) prints worksheets and answer sheets from K-8 Math lessons. A Model III or Model 4 disk system and TRS-80 line printer are required.

Secondary Math and Science

Our **Essential Math Program, Vols. I and II** are drill and practice programs for grades 7-12 and are available on cassette or disk for Model III and Model 4. **Essential Math, Vol. I** (*26-1716, $199) includes exercises in addition, subtraction, multiplication, division, and more. **Essential Math, Vol. II** (*26-1719, $199) covers fractions, decimals and percents, and pre-algebra concepts.

Euclid Geometry Tutor (*26-1724, $39.95) lets students practice constructing proofs using nine basic postulates.

Advanced Graphics (*26-1714, $39.95) gives practice in analyzing equations, and plots graphs of functions and polar and parametric equations.

Vector Addition (*26-1720, $39.95) illustrates and plots components and sums of student-provided vectors. **Vector Addition for the Color Computer** (26-2638, $39.95) requires Extended BASIC and is available on cassette or disk.

Interpreting Graphs in Physics: Position and Velocity vs. Time (*26-1721, $39.95) poses graph-related questions.

Graphical Analysis of Experimental Data (*26-1722, $39.95) plots data pairs that the student inputs.

Investigations in Integral Calculus (*26-2600, $39.95) graphs and computes areas of functions. **Investigations in Integral Calculus for the Color Computer** (26-2641, $39.95) requires Extended BASIC and is available on cassette or disk.

Plane Analytic Geometry (*26-2602, $39.95) includes problems on straight lines and conic sections.

Number Theory (*26-2613, $69.95) includes definitions, examples and exercises on number theory concepts.

Matrices, Determinants, and Simultaneous Equations (*26-2620, $49.95) generates problems related to simple matrix algebra.

Quadratic Equations (*26-2623, $49.95) covers coefficient recognition, discriminant evaluation, and more.

The Solar System: Featuring the Discovery of the Planet Pluto (26-2647, $59.95) combines graphics and recorded speech to present facts about the planets. A 16K Color Computer, TV and cassette recorder are required.

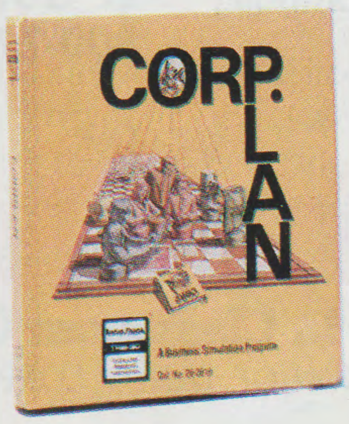
Not including Color Computer programs, the above are available on cassette or disk for Model III and Model 4.

The **TRS-80 Chemistry Lab** uses graphics and equations to simulate chemical reactions. Students control variables.

TRS-80 Chemistry Lab, Vol. I is available on cassette or disk for Model III and Model 4 (*26-2609, $199), and on cassette for the Color Computer with Extended BASIC (26-2626, $199). **Additional Student Experiment Books** (26-2666, $3 each) are available.

Help Prepare Students for the World of Business

Our **Corplan**™ business simulation program (*26-2619, $49.95) gives instructors an effective way to demonstrate the many facets of business management. Corplan realistically simulates the operations of a company. Requires no previous knowledge of computer operation or business programs. Requires a 48K Model III or Model 4 disk system. An optional printer can be used to produce copies of the program's charts and reports.

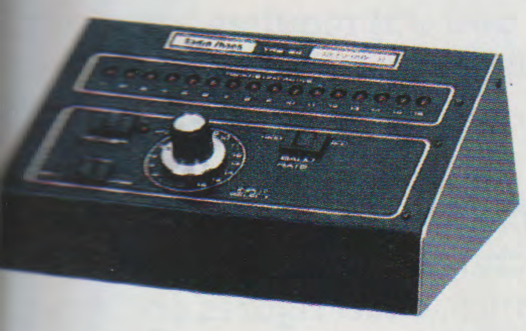


Our **Numeric Data Entry Practice** (*26-2601, $39.95) is a 25-lesson practice course to help students develop speed and accuracy in entry of numeric data using a 10-key pad. It requires a 32K Model III or Model 4 disk system. Printer is optional.
Business Education (26-2654, $599.00) supplements business accounting curriculums. Requires 48K Model III or 64K Model 4 2-disk system. Printer required.

***Network 3 compatible**

TRS-80 Shared Learning Systems

A **TRS-80 Network** lets you implement a shared learning system—connecting non-disk student stations to the teacher's disk, or "host" computer. Students can access programs with low-cost TRS-80 non-disk computers. The teacher can send programs to the student computers, and their work can be saved on the teacher's diskettes. An optional line printer attached to the host computer lets students get printouts of their programs. Your computer lab requires less duplicate courseware because several students share the same software. We also offer a variety of Network systems to meet your particular needs.



Radio Shack's **Network 2 Controller** (26-1211, $499) enables up to 16 non-disk student stations to be connected to the teacher's host computer using the cassette ports. The Network 2 Controller can be used with a Model III or Model 4 disk and non-disk computers; with Color Computer disk and non-disk systems; or with the Model 100 computer. Controllers can be cascaded to connect more stations. All cables are included.

The **Network 3 Controller** (26-1212, $599) enables up to 16 non-disk Model III or Model 4 student workstations (with RS-232C interfaces) to select and access lessons stored on the teacher's Model III or Model 4 disk system. Network 3 is designed for use with the educational software packages indicated in this catalog by an asterisk (*). Connecting cables available separately. Requires **Network 3 Operating Software** (26-2775, $149), or Network 3 Hard Disk Operating Software (26-2778, $149).

The **Network 4 Shared Learning System** adds flexibility and economy to your computer lab or classroom. Using a twisted-pair cable, the Network 4 lets you connect up to 63 non-disk Model III or Model 4 student stations to a central host computer with a hard disk drive. The student stations can then share hard disk files, each station operating virtually as a stand-alone system. Each user can quickly access a set of teacher-designated programs and data files from the hard disk. Information can be sent from station to station without using the hard disk and reports can be printed on a printer at the host computer. The Network 4 system requires a Model 4 host with a **Master Upgrade Kit** (26-1136, $299.95), a 15-megabyte hard disk (26-4155), **Network 4 Operating Software** (26-2773, $230), 64K Model 4 student stations (26-1058) and cables. Model III or Model 4 systems can be upgraded with a **Student Station Upgrade Kit** (26-1137, $299.95).

Our TRS-80 Education Management Systems

School Administrative Software Series

Interactive system to help schools collect, store, retrieve and print basic student information, attendance data, grades and scheduling information. Each program requires a TRS-80 Model 12 or Model 16 with two floppy disk drives (or one floppy drive and hard disk), or a Model II with one floppy drive and hard disk. A line printer is required to produce reports. All packages except the Student Information System require a Radio Shack CR-510 Card Reader plus the Student Information System.

The Student Information System (26-2729, $249) helps ease the burden of record-keeping. Easily collect, record, update, retrieve and distribute student data.

The **Attendance System** (26-2730, $330) helps keep track of attendance of students entered.

Attendance Cards (26-2741, $24.95 Pk. of 500).

Class Roster Forms (26-2744, $19.95 Pk. of 500).

Our **Grade Reporting System** (26-2731, $380) records and prints grades and more for each class.

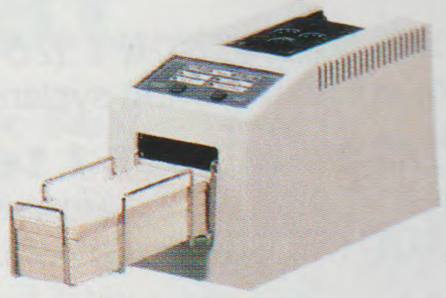
Report Card Forms (26-2745, $9.95 Pk.of 500).

Grade Cards (26-2742, $12.95 Pk. of 500).

The **Scheduling System** (26-2732, $290) helps plan and update school master schedules, anytime.

Course Request Cards (26-2743, $24.95 Pk. of 500).

Student Schedule Forms (26-2746, $9.95 Pk. of 500).



Automate data compilation, evaluate surveys and polls, or correct multiple choice tests with the **TRS-80 CR-510 Card Reader** (26-1266, $1595). It provides single, demand or continuous feed operation, reads marked or punched cards, and is controlled through manual switches or software. The CR-510 includes a diskette with COBOL and BASIC driver routines, and requires a TRS-80 computer with RS-232C port. Cables available separately.

Football Scouting Program

Store and analyze scouting information on your opponent's offense with **CHAMPS**™ (26-2703, $149.95). Designed for high school and college levels, CHAMPS provides various charts and statistical reports. Includes ten CHAMPS Scouting Manuals. **Additional Scouting Manuals** (26-2708, package of 10 for $39.95) are available. Requires a Model III or Model 4 disk system and a 132-column printer.

REKORD Planner is a quick access data management system adaptable to your own needs. A program and tutorial diskette, plus sample formats are included. Choose from **Administrator's Version** (26-2725, $499), **Counselor's Version** (26-2726, $499) and **Special Programs Version** (26-2727, $499). A Model III or 4 disk system is required.

Radio Shack's Computer Education Series

Complete **Basic Programming** classroom packages for secondary and post-secondary levels include overhead transparencies, a teacher's manual and 25 student workbooks.

Part 1: Introduction to BASIC (26-2150, $220) introduces students to the TRS-80 and BASIC. **Additional Student Workbooks for Part 1** (26-2151, $3.50 each) are available.

Part 1: Videotape Lessons (26-2753, $349) is a series of ten 30-minute lessons based on Part 1: Introduction to BASIC. Requires the Part 1 student workbook.

Part 2: BASIC Programming (26-2152, $260) builds on the concepts introduced in Part 1. **Additional Student Workbooks for Part 2** (26-2153, $4.50 each) are available.

Part 3: Advanced BASIC (26-2154, $260) introduces the INKEY$ statement, ASCII character set, action graphics and more. **Additional Student Workbooks for Part 3** (26-2155, $4.50 each) are available.

Part 4: TRSDOS (26-2156, $299) covers concepts of the TRSDOS operating system. **Additional Student Workbooks for Part 4** (26-2157, $4.50 each) are available.

Introduction to TRS-80 Level II BASIC (26-2116, $9.95) is a beginning BASIC textbook for secondary students.

NOTE: Software not included in the above series. Student activities are designed for hands-on experience with Level II or Model III BASIC (or TRSDOS in Part 4).

Learn Machine Language

The **Illustrated Computer** (26-2670, $44.95) introduces secondary students to machine language programming concepts using simplified machine language. Requires 32K Extended BASIC Color Computer with disk drive.

Network Pascal (26-2739, $799) is a new version of TRS-80 Pascal (26-2211) designed for use with Model III/4 and Network 3 in a classroom environment. Many new features including a combined editor/compiler. Model III or Model 4 disk system required.

Additional Student Manuals (26-2740, $14.95).

Introduction to Pascal (26-2674, $350) is a complete, structured teaching package with teachers manual, overhead transparencies and 25 student workbooks.

Additional Student Workbooks (26-2675, $7.95).

TRS-80 COBOL for Models II, 12, 16, Vol. One (26-2706, $49.95) teaches fundamental concepts. Requires COBOL Development System (26-4703, $29[illegible] and a Model II, 12, or 16 computer. Use as a self-teaching tool, or with Class Notes (26-2723, $9.95).

Computer Literacy Packages

Computer Discovery™ introduces computers and basic programming concepts. Each includes interactive exercises, workbooks, and instructor's manual. **Computer Discovery for Junior High** (26-2630, $189.95) requires a Model III or Model 4 disk system. **Additional Workbooks** (26-2635, $4.25 each). **Computer Discovery for Senior High** (26-2632, $189.95) requires a Model III or Model 4 disk system. **Additional Workbooks** (26-2636, $4.25 each).

Careers in Computing (26-2758, $130) Includes teacher's guide, 30 student manuals, narrated filmstrip, eight spirit masters and wall chart. **Additional Student Manuals** (26-2759, $1 each).

Computer Literacy: Computers Past and Present (26-2751, $9.95) is designed for students in grades 4 through 8.

The **Computer Connection** (26-2663, $69) introduces basics of computer literacy to junior and senior high school students. Includes teacher's guide, spirit masters, four wall charts and narrated filmstrip.

Radio Shack and TRS-80 are #1 in the Classroom

Radio Shack is the leading marketer of microcomputers to schools, with more TRS-80 computers in America's schools than any other brand. And we maintain an extensive development effort to produce educational materials that use microcomputer technology in the best ways possible.

We offer educators a variety of special services. Our National Bid Department gives prompt attention to school bids. Our National Lease Department can put the TRS-80 into your classroom with terms that meet almost any budget. We offer "carry-in" and "on-site" service plans, too. And as an educator, you are eligible to attend our classes for educators without charge, at one of over 400 Radio Shack Computer Centers.

Radio Shack gives you complete support. We have 32 Regional Educational Coordinators located across the country. They can conduct demonstrations, workshops, and in-service training sessions for your school district. And our Regional Educational Coordinators can assist you in selecting the computer system and courseware that best suit your needs. For more information, visit your nearest Radio Shack Computer Center or participating store or dealer. Or call your Regional Educational Coordinator.

For the name of the full-time Regional Educational Coordinator in your area, call our Education Division at 800-433-5682, toll free. In Texas, call 800-772-8538.

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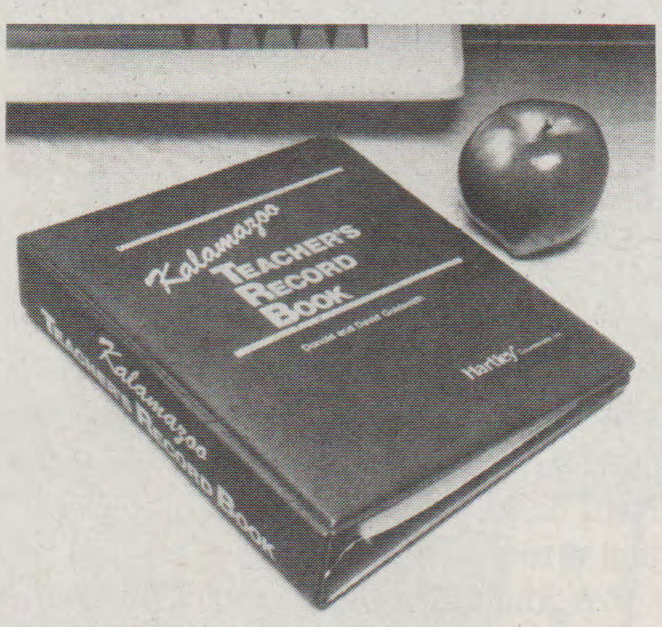
Software *(continued)*

Gradebook Provides Weighting Options

The Kalamazoo Teacher's Record Book, available for the Apple II, IIe and IIc, Commodore 64 and IBM PC,



MORE THAN 400 PRINT FORMATS

enables the teacher to calculate grades by a variety of weighting methods—total points, proportional values, or individual assignments. Means and standard deviations for all assignments can be computed automatically.

Readjustment of the grade curve on any assignment of average is made by changing the score range.

Other program capabilities include automatic re-entry of duplicate class lists; listings of number of A's, B's, etc., on any assignment; and more than 400 different formats for printing individual reports or class summaries.

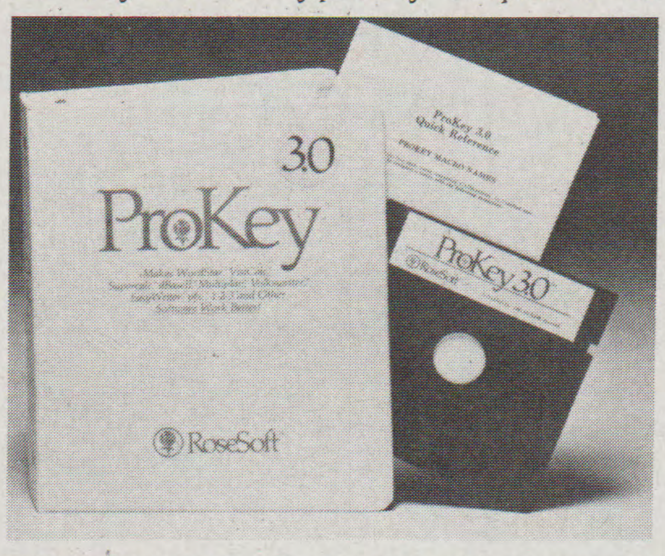
An unlimited number of data disks may be generated and backed up. Each data disk will hold ten classes of 120 students. *Hartley Courseware, Inc., Dimondale, MI.*

Write No. 205 on Inquiry Card

Typed Commands Made Single Keys

ProKey 3.0 software creates "shortcuts" through IBM-compatible databases, spreadsheets and word processors by enabling users to store frequently used, typed commands as single keystrokes.

This software creates customized function keys, each of which can save more than 10,000 characters and commands. A single keystroke will recall and replay the entire sequence. As an example, the publishers note that the 26 keystrokes typically required to



FUNCTION KEYS HOLD 10,000 CHARACTERS

update and print a graph in Lotus 1-2-3 can be stored as one keystroke.

Invisible to application software, ProKey 3.0 lets users create more than 300 function keys. It runs on the IBM PC, XT, AT, 3270 and most MS-DOS workalikes. *RoseSoft, Seattle, WA.*

Write No. 267 on Inquiry Card

Math Series Focus Is Reinforcement

Krell Software announces a 22-disk addition to its Basic Educational Skill Tutorial (BEST) series. The Language of Mathematics Series provides drill and practice reinforcement for basic math.

The new series consists of nine separate units: numbers, processes, geometry, graphs and charts, money terms, measurement, rates and ratios, comparison and description, and a dictionary of mathematical terms.

Each multi-disk unit is available for the Apple II+, IIe and IIc. Special multi-unit prices are available. *Krell Software Corp., Stony Brook, NY.*

Write No. 250 on Inquiry Card

Supplement Teaches Information Access

Information Handling Services, a supplier of technical information in microfilm, microfiche, hard copy and on-line form, has published an educational package to familiarize engineering students with information gathering techniques.

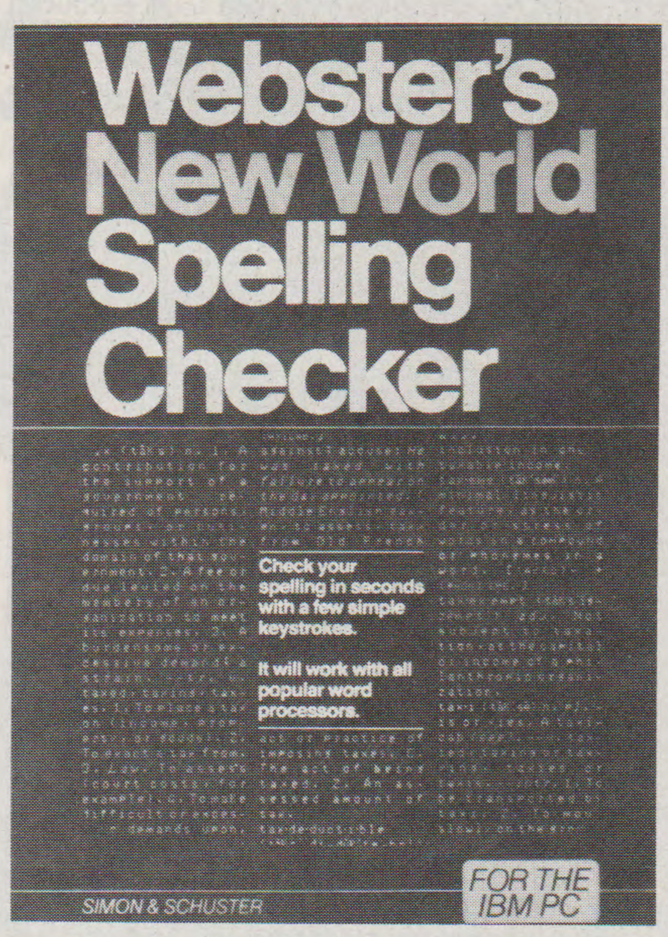
Titled Information Sources: A Guide for the Engineer, the kit allows the instructor to conduct a brief but comprehensive seminar in the area of technical information research, the publishers say. Included are student manuals; demonstration transparencies for overhead projection; and a sample microfiche file representing military specifications, vendor catalogs, industry standards and federal regulations.

According to an IHS spokesman, the text, lesson plans and exercises were authored by three academic advisors who are recognized in the engineering field. *Information Handling Services, Englewood, CO.*

Write No. 270 on Inquiry Card

Spelling Checked For 40,000 Words

Webster's New World Spelling Checker software is based on Simon & Schuster's Webster's New World Dictionary, College Edition, the dictionary used by the New York Times, Wall Street Journal, The Washington Post, Associated Press, and United Press International.



FOR POPULAR WORD PROCESSORS

The program automatically checks for misspelled words after the document is finished. It comes with a built-in vocabulary of 40,000 words, and users can add their own words for specialized requirements.

The Spelling Checker will interface with most popular word processing programs, including WordStar, PFS:Write, and Apple Writer. It is available for IBM PC, PCjr, and the Apple II family of computers. *Simon & Schuster Electronic Publishing Group, New York, NY.*

Write No. 253 on Inquiry Card

(continued on page 48)

← **Write No. 13 on Inquiry Card**

Software *(continued)*

On-Line Skills Are Practiced Off-Line

Students can learn how to logon to public message systems without actually going on-line, with educational software called The Electronic Village.

The heart of the program, the Bulletin Board Simulator, teaches students in Grade 3 and up how to logon and operate commands in a message system environment. Learning off-line saves modem and phone line costs, the publishers point out.

The program also contains two brief Tutorials about bulletin board systems and a screen or hard-copy Resource Listing of active message systems. Also included are reference cards and teacher support materials.

Licensed for multiple copies within each school, The Electronic Village is available for Apple II+, IIe and IIc computers with 48 Kbytes and one disk drive. *Exsys, Greeley, CO.*

Write No. 230 on Inquiry Card

Statistics, Graphics Joined in Software

Wadsworth Professional Software, Inc. has released Statpro XT, an integrated statistical analysis program for the IBM XT. The program offers a selection of statistical routines, as well as integrated graphics and data management capabilities.

According to the publishers, Statpro XT is one of the few programs on the market that has been specifically designed to take advantage of the storage capacity of the XT's 10-Mbyte hard disk.

The new program provides a range of data transfer utilities that allow the program to accept files originally written in various ASCII, DIF, SYLK, p-System, Lotus 1-2-3 and dBase II formats.

The seletion of data analysis procedures and integrated capabilities offered by Statpro XT include descriptive statistics, regression, analysis of variance, multivariate analysis and time series. Versions of this software for the IBM PC and the Apple II and III also are available. *Wadsworth Professional Software, Inc., Boston, MA.*

Write No. 257 on Inquiry Card

Manager Integrates Various Applications

Fourth Dimension Systems, Inc. has introduced Autodos, a menu-driven system manager that integrates various application programs into IBM PC XTs, PC/MS-DOS and PC ATs.

Autodos can pass a command string to a printer to format the printer prior to automatically running the word processor, according to the publishers. It also can set up modems or other peripheral devices requiring special configuration commands.

Maintenance commands, usually a sequence of DOS commands, file names and drive specifiers are chosen from the menu, eliminating the possibility of inadvertently formatting a hard disk through a simple typographical error.

Additional features include macro-command menu choices for compiling, linking or saving; and an Instant-Edit mode for updating various menus. *Fourth Dimension Systems, Inc., Santa Ana, CA.*

Write No. 240 on Inquiry Card

Scores Managed For 255 Students

Educator Software has released a recordkeeping program for instructors from junior high through college. Class Records 2.3 handles as many as 255 students per class, with typically 60 entries per student for a class of 35.

It totals points and facilitates grading on a curve: the instructor selects the grade lines and the computer converts all scores to the standard 90, 80, 70 or 60 scale.

In addition to the ability to weight entries; drop lowest score(s); and print class lists, histograms or individual reports; the Class Records 2.3 system can ignore designated grades, merge files, transfer data between files, and print missing assignment reports.

Requirements are a 48-Kbyte Apple II+, IIe or IIc running under DOS 3.3, and a single disk drive. Individual and school licenses are available with a 30-day refund policy. *Educator Software, Los Osos, CA.*

Write No. 207 on Inquiry Card

(continued on page 52)

DIGITAL BRINGS VAX TO LARGE SCALE COMPUTING.

INTRODUCING THE VAX 8600 SYSTEM.

Your applications can do exactly what you want them to on Digital's new VAX™ 8600 computer system. They can expand.

User population can increase. Scientific problems can become more complex. Transaction volume can intensify. And data storage requirements can grow exponentially.

The VAX 8600 system gives you unprecedented capacity for applications growth. It's the first of a new generation of large scale VAX processors, with memory expansion to 32 million bytes and online storage up to 160 billion bytes. Yet the VAX 8600 system maintains complete architectural compatibility with every other VAX processor – including the new desktop-size MicroVAX I™ system. Every system in the family gives you the same VMS™ operating system software, with the same set of proven development tools, communications options and data management facilities. Quite simply, there's not another computer family in the world that can match the growth path you get with Digital's VAX systems.

YOU GET UP TO 4.2 TIMES THE PERFORMANCE.

We've engineered the VAX 8600 system to deliver more than four times the processing speed and performance that the industry-standard VAX-11/780 system is known for. We've achieved this performance increase through the use of ECL gate array technology and several advanced engineering techniques.

Specifically, the VAX 8600 system incorporates four-stage pipelined processing that increases throughput by allowing the system to execute one instruction while it simultaneously decodes a second, generates an address for a third and fetches a fourth. There's also a floating point accelerator that speeds floating point operations.

Even with all its power, the VAX 8600 system conserves floor space. The CPU fits into the same size cabinet as the VAX-11/780 CPU. Power consumption and air conditioning requirements are similar, too.

VAX 8600 SYSTEM HIGHLIGHTS

MAXIMUM MAIN MEMORY SIZE	32 Million Bytes
MAXIMUM STORAGE CAPACITY	160 Billion Bytes
MAXIMUM COMMUNICATION LINES	512 plus Local and Wide Area Networks
PROGRAM ADDRESS CAPACITY	4 Billion Bytes
BUS SUPPORT	Availability includes 6 UNIBUS,™ 2 SBI, 4 DR780, 3 CI and 4 MASSBUS™
PHYSICAL DIMENSIONS	60½″ x 73½″ x 30″
POWER CONSUMPTION	6.5 KW (10 KVA)
AIR CONDITIONING REQUIREMENTS	22,200 BTU/hr
ACOUSTIC LEVEL	60 dBA

VAXCLUSTERS LET YOU SHARE THE WEALTH OF VAX RESOURCES.

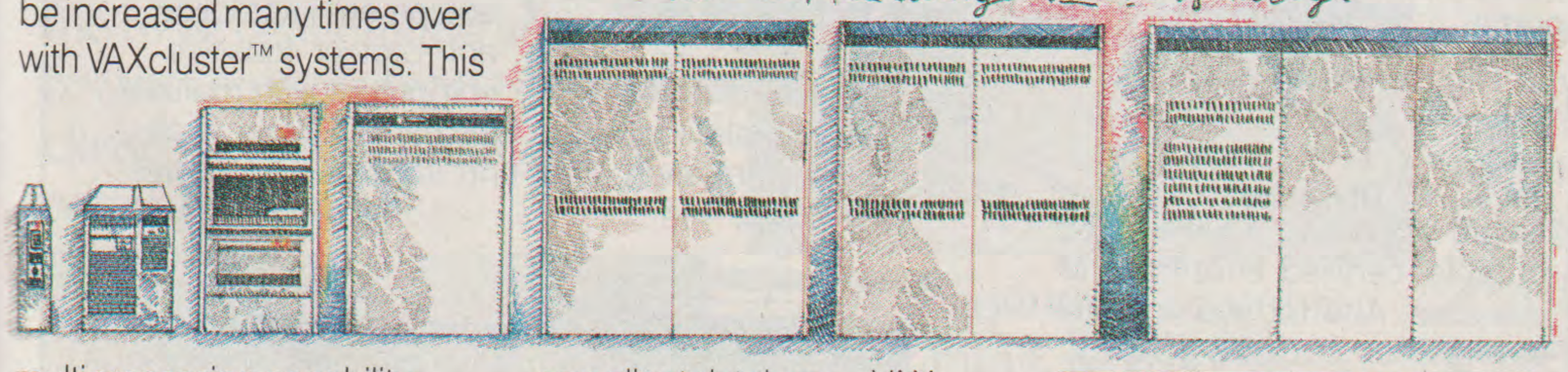
The large-scale storage and multi-user support you get with Digital's VAX 8600 system can be increased many times over with VAXcluster™ systems. This multiprocessing capability, which is unique in the industry, lets you combine the resources of several VAX processors and manage them as a single system. VAXcluster systems enhance data integrity and increase system availability, with complete user transparency.

VAXcluster systems can be configured with up to 16 processors and storage servers in a variety of combinations. You can boost computing power in an existing VAXcluster configuration by adding a VAX 8600 system. Or you can build a new VAXcluster using a VAX 8600 system as a compute server.

The wealth of resources available to all VAX systems includes VAX Information Architecture, which offers a CODASYL-compliant database – VAX DBMS; and a relational database – Rdb/VMS. This software, together with the RMS hierarchical file manager which is part of the VMS operating system, can all use the DATATRIEVE™ user-friendly query language. And they all benefit from a Common Data Dictionary that eliminates data redundancy and permits record-, field- and user-specific security controls. What's more, you can automate your office with Digital's ALL-IN-1™ software.

All VAX systems give you a complete set of program debuggers, editors, and screen management utilities to work with. You have a choice of 15 programming languages. And you can combine different languages in a single application through the common calling standard.

The expanding VAX family.



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Digital's VAX 8600 system is compatible with every other VAX processor. It can also work with many other systems you may already own. Digital's DECnet™ networking software links Digital systems, users, files and applications over a variety of communication devices, such as Ethernet, leased lines, standard telephone lines, and public wide area networks. We offer protocols for communication with non-Digital environments, such as the SNA™ gateway.

The VAX 8600 system is engineered for the reliability your large-scale applications require. Self-diagnostic intelligence simplifies maintenance.

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Write No. 49 on Inquiry Card

Software *(continued)*

Apple Keyboards Give Piano Lessons

The Magic Piano Music Learning System includes three programs: a music creativity tool called the Magic Piano; and two related skill-building programs, the Rhythm Game and the Melody Game.

The Magic Piano transforms the Apple keys into piano keys, the publishers say, and introduces the formal aspects of music through informal creative play. As users play songs on the keyboard, the program scores and displays each song on the screen.

Rhythmic skills are sharpened in the Rhythm Game, which presents 276 pre-selected rhythms. The Melody Game develops tonal memory with a musical Simon Says that has nine levels of difficulty. The programs come with a User's Guide and a Music Workbook. *Edusoft, Berkeley, CA.*

Write No. 229 on Inquiry Card

Test Scored With Optical Reader

National Computer Systems has announced Microtest Score II microcomputer software, the latest in its Testware series of mini- and microcomputer-based software for test scoring and processing. This test scoring and reporting package uses optical mark reading (OMR) for data entry and a microcomputer for data processing.

Microtest Score II allows users to score tests which contain multiple subtests, merge data files, statistically analyze test data and produce a wide range of reports that have been designed to meet a variety of test reporting requirements. Report options include Individual Test Results Report, Distribution Report and Item Analysis Report.

The program operates on the NCS Sentry Plus system, which includes a Sentry 3000 scanner and an IBM or equivalent microcomputer. *National Computer Systems, Minneapolis, MN.*

Write No. 212 on Inquiry Card

AI Database Has Added Capabilities

Buyers of the Artificial Intelligence Database Savvy PC are receiving a new, upgraded version of the product, according to the publishers, Excalibur Technologies Corp.

Savvy PC interprets imprecise commands and compiles efficient programs from a series of such commands. Using a virtual memory system, the product handles linking, memory allocation, data typing and other chores without requiring the user to answer many questions, the publishers say.

Enhancements include more than two dozen new commands, such as "PUSH SCREEN" and "POP SCREEN" for exiting and returning to activities. Savvy PC now runs under IBM's PC-DOS, which provides increased capability with other DOS files.

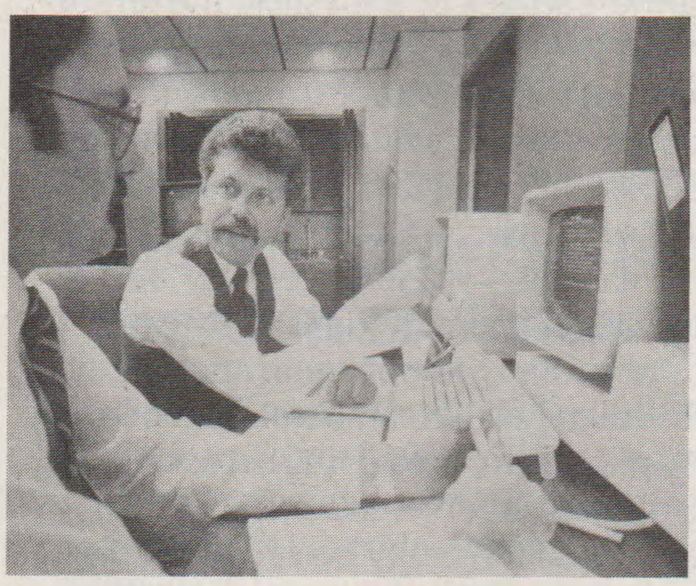
Upgrades are available for a minimal fee. *Excalibur Technologies Corp., Albuquerque, NM.*

Write No. 206 on Inquiry Card

(continued on page 54)

Enrollment Building Ideas for the '80s

You're committed to education. Training students for careers in a fast-moving, rapidly changing world. And we're committed to helping you provide those students the best possible education. We're **United Education and Software/ Data Systems Group,** and we can show you how to enhance curriculum for better education, more profit, and higher enrollments.



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Software *(continued)*

WordStar Files Sent Via Networks

TelMerge, an asynchronous telecommunications package for WordStar users, provides the capability to send paper or electronic mail through communications networks.

The user selects the TelMerge option from the WordStar main menu, then the desired communications service from the TelMerge menu. The program automatically converts WordStar documents into standard ASCII text, dials, logs in, and transmits a document.

Electronic mail services supported include Western Union's EasyLink, MCI Mail, Tymshare's Ontyme Messaging Service, RCA's Telextra, and ITT's Timetran. In addition, TelMerge provides VT-100 emulation support for reaching mainframes equipped with dial-in lines. It also supports the IBM 3270 PC microcomputer.

Several "special invitation" discount offers from major communications networks and on-line information services are being packaged with TelMerge. *MicroPro International Corp., San Rafael, CA.*

Write No. 211 on Inquiry Card

Popular Network Connects 63 Macs

Corvus Systems, Inc. has introduced its Omninet local area network for Apple Computer's Macintosh. OmniDrive, with its built-in disk server, and a shared printing facility are available for use on the Macintosh network.

The Macintosh Omninet network can connect up to 63 Macintoshes at distances up to 4,000 feet. The network interface card is built into the computer interface cable, and users simply plug the cable into the modem port at the back of the Macintosh. Running at .7 megabaud, Omninet for the Macintosh is faster than Apple's proposed network for the Mac, according to a Corvus spokesperson. *Corvus Systems, Inc., San Jose, CA.*

Write No. 232 on Inquiry Card

All Desktop IBMs Have CAD Support

With the announcement of enhanced AutoCAD for the IBM 3270 G and GX, Autodesk, Inc. claims to be the first CAD software manufacturer to support the full family of IBM desktop microcomputers.

The new CAD package takes advantage of the 3270's advanced graphics technology and supports the PIF (picture interchange format) micro-to-mainframe protocol. It also utilizes the workstation's capacity for high-speed picture regeneration, polygon fill, and character generation.

In addition, the 3270 G/GX AutoCAD package lets the user do a "print screen" to a dot-matrix or ink-jet printer.

AutoCAD is available for every IBM desktop computer, as well as for hardware from 18 other microcomputer manufacturers and 25 input and output device manufacturers. *Autodesk, Inc., Sausalito, CA.*

Write No. 224 on Inquiry Card

Color Sketch Pad Has Nine Speeds

Nine paintbrush speeds for precise work is one of the features of Doodle!, a color sketch pad graphics program for the Commodore 64. In the program's Sketch mode, users also may create with joystick or trackball in their choice of nine pen sizes and erasers.

Because Doodle! works in machine language, it responds instantly to transform drawing commands into high-resolution graphics, according to the publishers. A Stamp command lets the user design nine original, repeatable graphic symbols.

NINE PAINTBRUSH SPEEDS

The software's Letter feature makes it possible to type in keyboard graphics, letters or numbers in any direction. Doodle! works directly with several popular printers, including models from Commodore, C. Itoh, NEC, Epson, Star/Gemini and Okidata. *City Software Distributors, Inc., Milwaukee, WI.*

Write No. 254 on Inquiry Card

Equations Solved With 19 Variables

A program titled VariCalc, for the Apple II family, interactively solves science, engineering and business equations. VariCalc can simulate complex physical, chemical or mathematical processes as well as accept real-time input directly into a predefined model, the publishers say. VariCalc uses "variators" to change variables interactively. The variators can be two game paddles or a joystick, the left or right arrow keys, an automated loop variator with selectable range and step size, or the analog voltage from the publisher's Adalab data acquisition interface card.

VariCalc will solve for any one of 19 variables on the right or left side of a formula without rearranging the formula. Results can be plotted on the Apple computer's high-resolution graphics screen or in hard copy. Up to 255 equations may be stored on disk. *Interactive Microware, State College, PA.*

Write No. 251 on Inquiry Card

Clowns Star In New Math Offering

The Minnesota Educational Computing Corp. (MECC) has announced a new product in its elementary math drill series. Circus Math is designed for second and third grade students and focuses on whole number addition concepts normally taught at this level.

The software presents drills which combine problems with graphic sequences. Programs in the package are sequenced in level of difficulty. They include Clown Maker, Clown Car, High Wire, Cannon Shoot and Elephant Walk.

Circus Math keeps records on individual students' performance. It operates on Apple II microcomputers with at least 48 Kbytes. A 29-page support manual is included. *Minnesota Educational Computing Corp., St. Paul, MN.*

Write No. 228 on Inquiry Card

Children Practice Pre-School Skills

A new early childhood game for pre-readers called Shapes and Patterns is now available from Learning Well.

This program offers three games for independent play by preschool to first grade children. Youngsters match shapes, find common shapes and learn to follow patterns—three skills the publishers note are essential to reading and math readiness. Animated and colorful graphics plus rewards from the Gift Machine help youngsters stay on task.

Special utilities allow teachers or parents to control the difficulty of the activities and review performance. Shapes and Patterns is available for the Apple II series. *Learning Well, Roslyn Heights, NY.*

Write No. 210 on Inquiry Card

Student Information Stored in 20 Fields

Instructors can computerize student records and information with Accumulator Jr., which accommodates information in 20 fields determined by the operator.

Accumulator Jr. is an abbreviated version of Accumulator II, which is designed for schools and is also available. Hardware required for either program is Apple II, II+, IIe or IIc. A compatible printer is optional.

The program may be previewed for $10, which may be applied toward purchase. *Southern Micro Systems, Burlington, NC.*

Write No. 268 on Inquiry Card

Utility Manages Multiple Programs

IBM designed TopView for IBM PC users who want to operate several different programs concurrently, switch quickly from one task to another, or view data from several applications using windows on a single display screen.

For example, an administrator writing a report could switch to a spreadsheet program and electronically cut and paste figures from the spreadsheet into the report, an IBM spokesman explained. At the same time, the computer can handle another task such as printing an address list or sorting files.

Both programs require one of the IBM PC family of computers with 256 Kbytes, an 80-column display and DOS Versions 2.0. 2.1 or 3.0. *IBM Entry Systems Division, Boca Raton, FL.*

Write No. 202 on Inquiry Card

Word Puzzles Fit Curriculum Needs

Puzzle Master for TRS-80 Models III and 4 creates word games which can be printed or played at the keyboard. Thousands of cross-word, word-find, anagram, and word-guess puzzles can be created—in seven game variations—from lists of words and clues stored on diskette, the publishers say.

Teachers can store the words and clues they wish Puzzle Master to use when puzzles are created, thus producing exercises that match their curriculum. Topical word-list diskettes can be purchased separately and can be edited by the teacher. *Shenandoah Software, Harrisonburg, VA.*

Disk Helps With Complex Chemistry

Students who require additional help to understand the sometimes difficult concepts of organic stereochemistry are the intended audience of a tutorial diskette for Apple II computers.

Titled Organic Stereochemistry, the program includes a tutorial defining stereochemical terms by example. It provides numerous randomly generated problems that drill concepts such as: absolute configuration assignment; and recognition on enantiomers, diastereomers and meso structures.

A tutorial and set of problems for the stereochemistry of cyclohexane rings also is included. *COMPress, Wentworth, NH.*

Write No. 222 on Inquiry Card

(continued on page 56)

Software *(continued)*

CAD Link Sends Files to Mainframe

T & W Systems, Inc., publishers of the VersaCAD computer-aided drafting program for the IBM PC and compatibles, has released VersaLink, a translation program that can move drawings between VersaCAD and any CAD system with an IGES-standard interface.

Used with GE Calma and Computervision mainframe systems, VersaLink provides the ability to use a VersaCAD workstation costing around $10,000 as an effective terminal for data collection and editing to a mainframe CAD computer, a T&W Systems spokesperson said.

Drawing files may be moved in either direction, with this first release including exchange of points, lines, arcs, circles and text, as well as certain properties of these objects. Symbol objects and other objects such as polygons can be transferred by "exploding" them into component parts. *T&W Systems, Inc., Huntington Beach, CA.*

Write No. 218 on Inquiry Card

Programs Provide Writing Practice

A new five-volume software series from Peachtree Software corrects common writing mistakes by sharpening self-editing techniques. Titled Writing Skills, the program features a built-in text editor for correcting written passages on the screen.

Each of the five volumes focuses on three or four specific areas of grammar. For instance, Writing Skills Volume 1, concentrates on possessives and contractions; noun plurals and possessives; and subject/verb agreement.

A pre-test requires the student to edit several passages containing grammatical errors. Based on the results, the software presents practice and testing in problem areas.

Available for Apple II, II+, IIe, Franklin Ace 1000 and the IBM PC, the program includes a grade book and class manager. *Peachtree Software, Atlanta, GA.*

Write No. 233 on Inquiry Card

Algebra Study Anxieties Removed

Two junior college instructors have produced a remedial college algebra course called Algebra Without Anxiety. The course, which also is suited for high school use, is designed to prepare students for college algebra. It covers subjects usually taught in two years of high school algebra, the authors say.

Algebra Without Anxiety includes both written and software materials. The written course consists of eight individually bound units collected in a three-ring binder. Three diskettes currently are available for Apple IIe's, with a total of nine diskettes planned in the series.

The first three units cover basic algebraic operations, signed numbers, combining expressions, linear equations, inequalities, literal equations, statement problems and formulas. *Algebra Without Anxiety, Gadsden, AL.*

Write No. 231 on Inquiry Card

(continued on page 58)

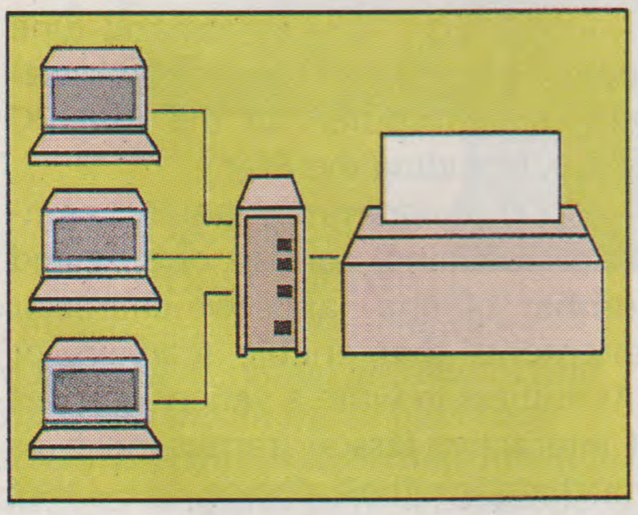
INTRODUCING THE SCOOTER® MULTI-BUFFER™

Now One Printer Works Like Three.

* *Also available in 128K, 256K and 512K units.*

MULTI-BUFFER ACCEPTS DATA FROM UP TO THREE MICROS, STORES UP TO 64K* AND INPUTS A SINGLE PARALLEL PRINTER. AUTOMATICALLY.

No more printer bottlenecks in your micro system or network. No more expensive switching boxes either. With Multi-Buffer, all data gets a turn at the printer, without anyone touching a switch. It's like having a printer for every micro–at a fraction of the cost, just $389 suggested retail.



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TJ-0185

Software *(continued)*

Encyclopedia Holds Clues to Adventure

Five instructional programs introduced by Grolier Educational Corp. encourage students to refer to The New Book of Knowledge Encyclopedia.

Max Dublin's Treasure, and The Isle of Mem, are programs using graphics and adventure to stimulate students to inquire from reference sources in the library to get answers and succeed with the objectives. Each program can store the locations of 30 students in the adventure and requires an average of four hours for each student to complete.

WonderQuest introduces the student to Lemmie, a character who represents the computer's branching capabilities.

GraphMaster and InforMaster are elementary graphics and database programs designed to teach the principles of computer graphics and database management. All programs come with Instructor's Guides, User's Guides and backup diskettes and are written for 64-Kbyte Apple II, II+ and IIe computers. *Grolier Electronic Publishing, Danbury, CT.*

Write No. 271 on Inquiry Card

Color System for Lesson Authoring

COMPress' latest release, the Color EnBASIC Authoring System, is a kit of software tools for increasing both the production efficiency and the quality of interactive programs, according to the publishers.

Whereas many authoring systems simplify CAI production by limiting the range of instructional approaches, EnBASIC is said to allow full control of the logical structure of the design. All of the features of BASIC are present, plus special graphics, input and answer commands.

Features include full-color text support, built-in chaining capability, answer judging, flexible display design, leftward writing capability, and special commands for colored boxes and frames. *COMPress, Wentworth, NH.*

Write No. 223 on Inquiry Card

PILOT Available For IBM Family

IBM PILOT is a command-type authoring language for creating courseware on computers in the IBM PC family, including the PCjr.

PILOT (Programmed Inquiry Learning or Teaching) consists of a limited number of one- and two-character statements that enable teachers or CAI authors to write a variety of types of interactive lesson frames, such as matching, multiple choice, true-false, simulation, fill-in-the-blank, direct question and text with graphics.

Features of IBM PILOT include a text editor; a graphics editor for all-points-addressable graphics, viewports, full-color control and animation; combination text/graphics screens; expression resolution; in-line mathematical programming; videodisc and other external device support; and ability to create structural features such as glossaries and help and hint routines.

Requirements are an IBM with 128 Kbytes RAM. *IBM Information Systems Group, Irving, TX.*

Write No. 201 on Inquiry Card

(continued on page 6

What we've learned in the classroom you can use in the office.

Counseling/Assessment

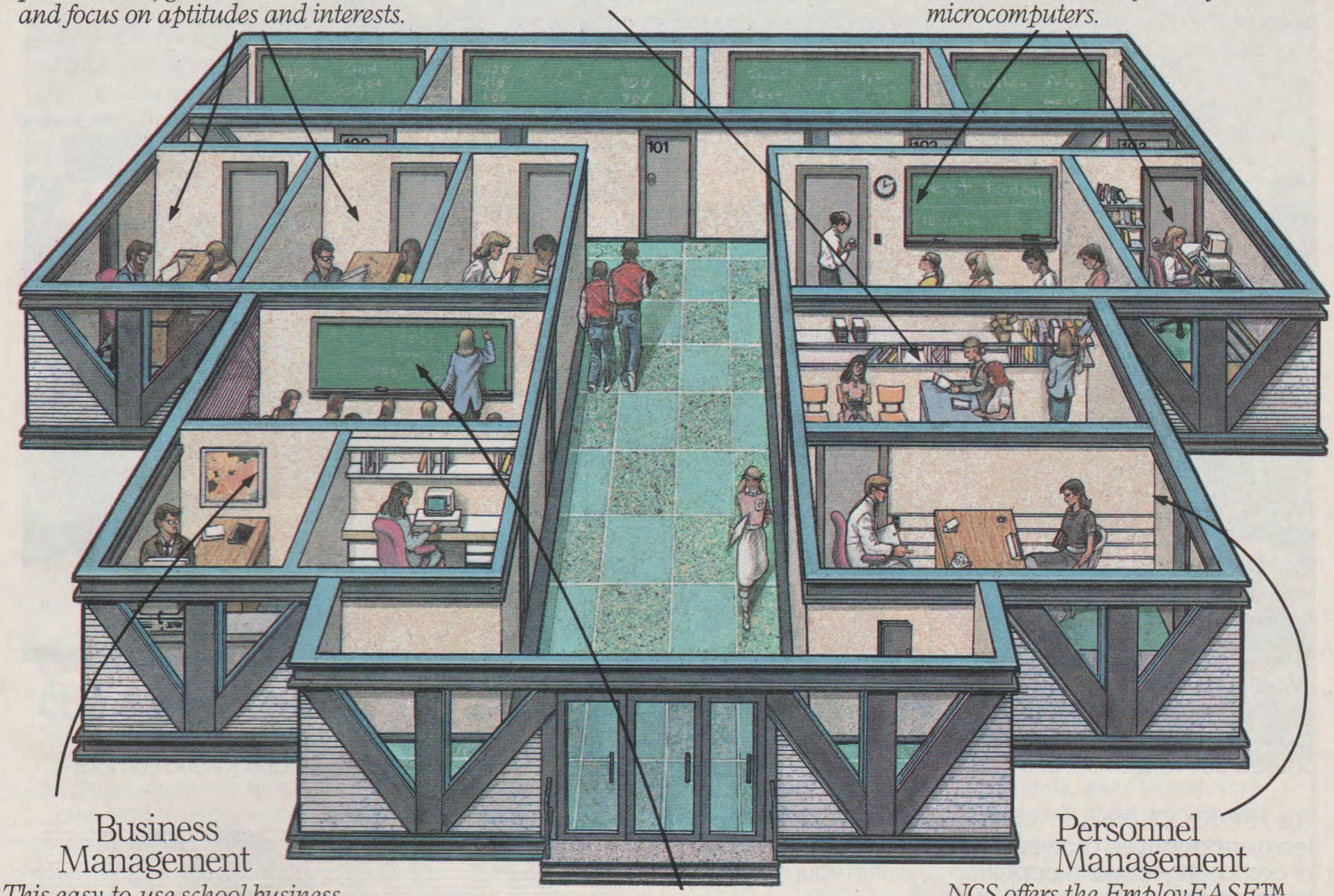
NCS provides guidance counselors with the Strong Campbell Interest Inventory, the Career Assessment Inventory™ and other testing software to analyze personalities, guide career directions and focus on aptitudes and interests.

Student Administration

NCS offers a family of microcomputer software for administrative tasks including scheduling, attendance and grade reporting.

Test Processing

NCS's Testware™ software processes nationally standardized achievement tests as well as locally developed tests and surveys and includes MICROTEST™ software for microcomputers.



Business Management

This easy-to-use school business management system automates and integrates the financial planning, accounts payable/receivable functions, check writing and payroll functions.

Instructional Management

This NCS family of software includes the IMS PLUS™ system for microcomputer networks that makes it possible to monitor student progress and prescribe instructional materials and appropriate individualized instruction.

Personnel Management

NCS offers the EmployEASE™ system to simplify the screening of applicants, maintain employee records and support the performance evaluation process.

Introducing NCS software for school system management.

Over the years, we've spent a lot of time in the classroom. Needless to say, we've learned a lot.

As a leading supplier of standardized test processing systems, we've studied the school management problems of teachers and administrators alike. And we've developed a comprehensive program for the entire school system.

NCS school management products provide complete information processing capabilities — from OMR equipment and scannable forms to computers, software, and complete service and training.

To find out more about the NCS approach to school system management, write National Computer Systems, P.O. Box 9365, Minneapolis, Minnesota 55440. Or call 1-800-447-3269.

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How to fill your classrooms. Every seven hours.

Accounting software is second only to word processing in units sold. It is also the number one growth area in software sales. Yet 40% of all accounting software remains unused due to lack of training.

The PROTOCOL program offers a series of four easy-to-learn, modularized courses for training people in the use of accounting software applications, within your microcomputer facility.

The courses are standardized and easy to administer, so you can use your existing instructional staff to teach them.

Each course runs only seven hours. So you'll be able to train people quickly and continuously, maintaining a consistent flow of students and revenue.

Each accounting course comes with instructional materials sufficient for teaching a class of ten people. All software and documentation are included, together with instruction manuals, overhead transparencies, and sample documents packaged in our executive quality Attache case.

The innovative PROTOCOL courses have been tested and proven successful at community colleges throughout the U.S.

So open your classrooms to a new source of revenue. And watch them fill with the financial rewards of PROTOCOL.

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Call toll-free 1-800-223-2216

Software *(continued)*

Software Connects Mac to Dow Jones

Dow Jones Straight Talk, a communications program for the Apple Macintosh, enables users to access more than 28 databases on Dow Jones News/Retrieval electronic information service. Information available includes the full text of The Wall Street Journal, a 20-volume encyclopedia, business and financial information, sports news, weather and movie reviews.

Information for Straight Talk can be placed directly into the Macintosh desk accessories, note pad and scrapbook. The software guides the user through the initial database set-up procedures and into the program itself. Additionally, Straight Talk allows the user to communicate with other Macintosh computers and to access other databases.

A 60-day limited warranty and one free hour of use on Dow Jones News/Retrieval are included. *Dow Jones & Company, Inc., Princeton, NJ.*

Write No. 203 on Inquiry Card

Package Introduces Chemistry Principles

Chemical Principles for the Introductory Laboratory illustrates the principles and methods involved in five main areas normally covered in general chemistry at the secondary to college level. It is offered by Conduit, a nonprofit organization that publishes educational software.

The programs, which may be used to help prepare students for laboratory work, should be accompanied by lecture or textbook discussions of the subject matter, a Conduit spokesperson said.

Modules included in the package are: Equilibrium/Ksp/Solubility; Acid-Base Titration; Coordination Complexes and Formation Constants; and Spectrophotometry and Beer's Law. Priced at less than $100, the material includes instructor's notes.

A sample of this package is available on Conduit's Chemistry Demo Disk. *Conduit, University of Iowa, Iowa City, IA.*

Write No. 258 on Inquiry Card

'Flash' Format Teaches Spelling

Customized "Flash" Spelling, the latest courseware release from Random House, allows teachers to customize their own spelling material for a weekly spelling test.

The program motivates students to concentrate intensely on spelling words which they have seen, but with whose spelling they may not be entirely familiar, according to the publisher. Students see a word flashed on the screen and must type it back within a given time limit.

The program is designed to advance both the difficulty of the words presented and the speed of presentation. Correct responses will immediately advance the student; incorrect responses will shift the program back to an easier level.

Flash Spelling is available on disk for the Apple II and IIe computers and for the TRS-80 Model III computer. It is available on cassette for the TRS-80 Model I and II. *Random House, Westminster, MD.*

Write No. 245 on Inquiry Card

Speech Patterns Displayed on Screen

The Video Voice Speech Training System is a computer-aided language learning station that lets speakers see what they say. The system's Speech Analyzer interprets sound input from a microphone, and its microcomputer displays them as trace patterns on a TV receiver.

Students get live visual feedback on their speech as they practice sounds and words by trying to match model patterns. The system software features built-in scoring, adjustable performance goals, vowel overlays showing where sounds map, and on-screen or printed pattern comparisons and progress reports.

Although originally developed as an aid for teaching the deaf to speak, the manufacturers say the system also has applications in correcting speech deficiencies not related to hearing loss, such as English as a second language and basic articulation problems. *Micro Video, Ann Arbor, MI.*

Write No. 262 on Inquiry Card

Geography Learning Includes History

States & Traits is a game that combines U.S. geography, history and current facts to supplement social studies learning for children age 9 and older.

States can be positioned on a graphic map of the U.S. outlining all the states or regions only. Traits games allow students to identify where the information belongs on the map. Traits games include bordering states and rivers, historical and current facts, and capitals.

Social studies teachers can design their own games by using built-in symbols and by adding new questions. Multiple skill levels provide challenge for various age groups.

States & Traits is available for Apple II+, IIe and IIc, Atari 400, 800 and XL series; Commodore 64; and the IBM PC or PCjr. *DesignWare, San Francisco, CA.*

Write No. 234 on Inquiry Card

(continued on page 62)

Software *(continued)*

Typing Program Is Improved

Mastertype, which teaches basic and advanced typing and keyboard skills using an arcade-style game format, is now improved, according to its publisher, Scarborough Systems, Inc.

On-screen finger positioning instruction, sentence and typing rhythm lessons and improved accuracy and skill measurements have been added to the program.

Like the original, New Improved Mastertype guides the user through 18 successive levels of difficulty. Each student can begin at his or her own level and proceed at an individualized pace, measuring speed and accuracy as they go. Users can also prepare their own lessons for practice on their own specific areas of difficulty.

New Improved Mastertype is available on disk for the Apple II family, Atari, IBM PC, XT and PCjr, and Commodore 64 computers. It is also available on cartridge for the Commodore 64 and Atari, and on 3½" disk for the Apple Macintosh. *Scarborough Systems, Inc., Tarrytown, NY.*

Write No. 243 on Inquiry Card

Student Spies Must Know Geography

Scholastic Software's geography game, Agent USA, has been released for the IBM PC and PCjr. It is currently available for Atari, Apple, and Commodore computers, as well.

Agent USA features a master spy who travels across the country via train in search of the elusive Fuzz-Bomb who is turning everyone into fuzzbodies. The player must rescue the country by defusing the FuzzBomb. Winning the game depends upon the player's skill in planning itineraries, learning time zone charts, the location of states, and the names and locations of their capitols.

Agent USA's high-resolution graphics include sunrise, dusk, and sunset colors, plus realistic urban skylines. The package includes a mapboard, poster, stickers, train schedule and a quick-reference card. *Scholastic, Inc., New York, NY.*

Write No. 266 on Inquiry Card

Calculus Programs Support Instruction

A collection of 27 programs, on four disks for Apple II computers, provides applications, graphical calculation tools and illustrations of the concepts of calculus.

Called The Calculus Toolkit, the series offers three basic program types: utility, explanation and drill. They are designed to augment traditional instruction by providing the means for exploring important calculus concepts and the tools for doing various computations frequently encountered in applying calculus.

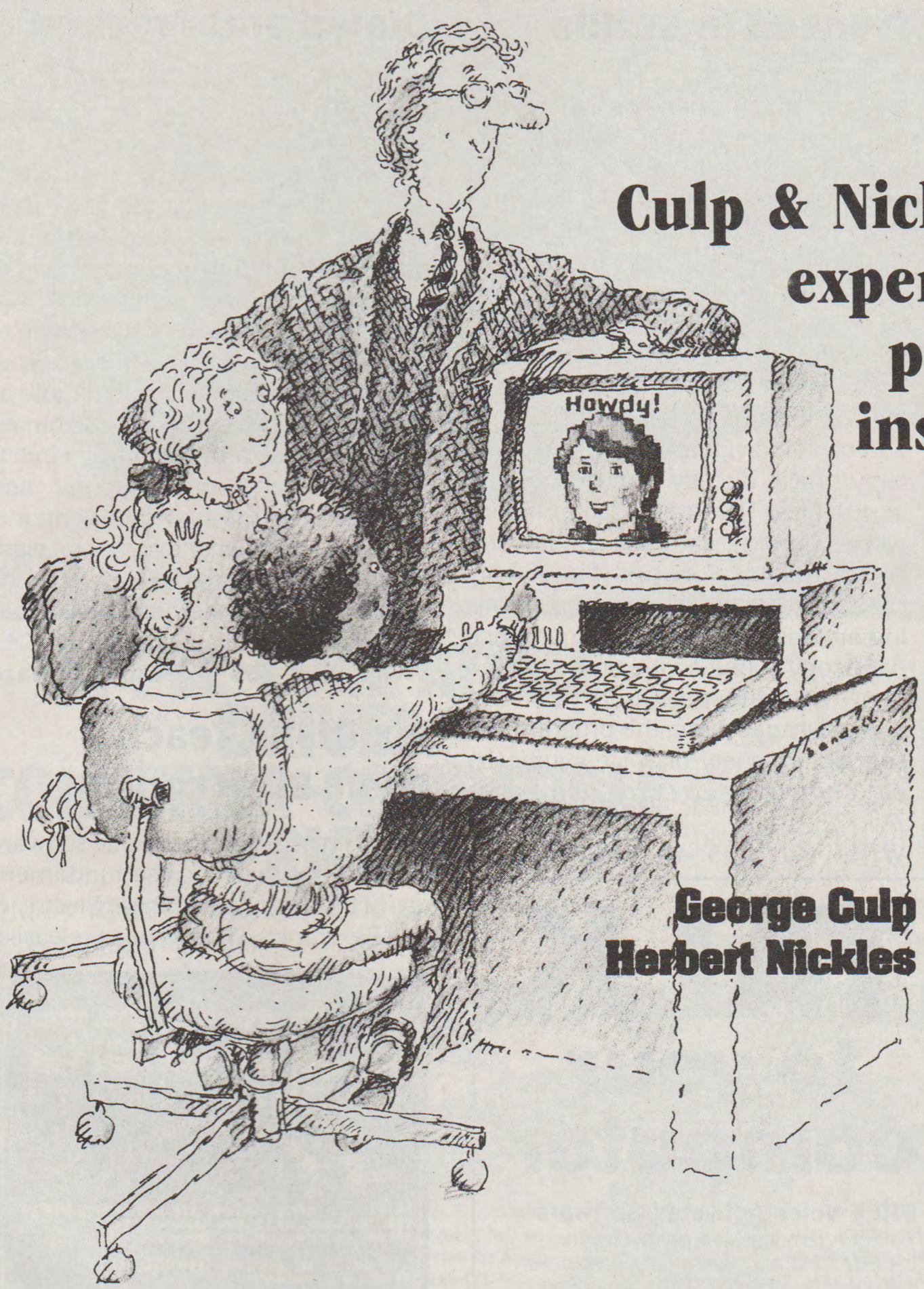
An opportunity for students to review areas in which they may have difficulty is provided.

According to the publishers, the programs give users control by allowing them to define their own functions and to specify settings. *Addison-Wesley Publishing Co., Reading, MA.*

Write No. 226 on Inquiry Card

(continued on page 64)

New from Brooks/Cole



Culp & Nickles provide expert help for preservice and inservice teachers!

INSTRUCTIONAL COMPUTING FUNDAMENTALS FOR IBM MICROCOMPUTERS

George H. Culp
University of Texas at Austin

Herbert L. Nickles
California State College at San Bernardino

A highly practical learning resource for all teachers who need to know the fundamentals of BASIC programming for the IBM-PC family of microcomputers.

Reflecting the authors' more than 25 years of combined instructional computing experience, the text is clear and straightforward. It's written specifically for teachers, and eschews computer jargon that can intimidate and confuse.

To facilitate learning, Culp and Nickles cover BASIC programming language statements and commands *before* discussing the specific steps needed to program IBM microcomputers computers.

They emphasize all *five* areas of instructional computing use: drill and practice, tutorial dialog, simulation and gaming, testing, and problem solving.

A 5¼" floppy diskette containing the text's program examples, a program menu routine, and solution programs to selected problems is available.

Also available from Brooks/Cole by the Same Authors (with supplementary software programs)

INSTRUCTIONAL COMPUTING FUNDAMENTALS FOR THE COMMODORE 64®

INSTRUCTIONAL COMPUTING WITH THE TRS-80®

AN APPLE® FOR THE TEACHER: FUNDAMENTALS OF INSTRUCTIONAL COMPUTING

Also Available from Brooks/Cole as Stand-Alone Software—

ALGEBRA ARCADE
Dennis Mick, Mike Konemann, Richard O'Farrell, and Jerry Isaacs.
An exciting graphic game that challenges students of every skill level to develop insights into the connections between functions and their graphs

THE WEPCO ELECTRONIC BLACKBOARD SERIES: ALGEBRA AND TRIGONOMETRY, AND THE FUNCTION PLOTTER
Richard O'Farrell, Dennis Mick, Jerry Isaacs, and Mike Konemann.

For further information write:
Neil Oatley, Editor

Brooks/Cole Publishing Company
555 Abrego Street
Monterey, CA 93940

Write No. 27 on Inquiry Card

Software *(continued)*

Nocturnal Program Networks Users

Nocterminal is an automated telecommunications program that allows users to enter data and leave their computer on-line for access by others. Other computers can then go on-line to review data and may be allowed to add to the data disk.

The program can be configured for a variety of needs. It provides the capability to create a directory as well as text files. Files may be customized to: password protect the entire system; allow the caller to create and upload text files; allow access to selected files by password; and allow the caller to attach comments to existing files.

Nocterminal requires an Apple II with 128 Kbytes or an Apple III with 256 Kbytes; two disk drives; and an auto-answer modem that supports the Hayes Smartmodem command set. *Nocturnal Software, Soquel, CA.*

Write No. 264 on Inquiry Card

Standard Text is Printed in Braille

Now anyone, blind or sighted, can generate hard-copy braille using a computer and a braille printer, according to publishers of the Braille-Talk program for Apple and IBM computers.

Users need not be familiar with braille; the program handles all the coding and formatting.

With the introduction of low-cost braille printers, it has become possible for institutions serving the blind and blind individuals to produce hard-copy braille directly from text stored in disk files. The Braille-Talk program will accept any standard text file and create from it a second file of fully contracted braille. The program's printing options are then used to produce hard-copy output on the braille printer.

To accommodate users who have a visual impairment, the program will support a variety of voice synthesizers. *Computer Aids Corp., Fort Wayne, IN.*

Write No. 255 on Inquiry Card

Minicomputer Calls Dialed and Tracked

Origin, Inc. has developed Call Tracker, a telephone history database and phone dialer for DEC PDP-11 and VAX minicomputers. According to company spokesmen, it is the first package for minis that doesn't require phone lines or dialing equiment to be brought into the computer room.

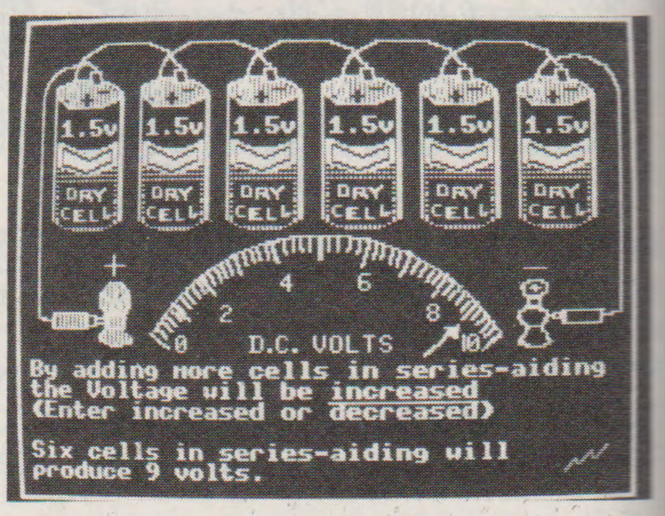
Call Tracker keeps track of who to call, when to call, and what was said in past conversations. It can handle as many users as there are terminals. Each user has a dialer that connects their terminal to the computer, and that also connects to their desk phone.

Each user can have up to eight different databases. Call Tracker includes report generation capabilities as well. *Origin, Inc., Los Angeles, CA.*

Write No. 265 on Inquiry Card

Six Disks Teach Basic Electronics

An interactive, six-diskette software package for teaching the fundamentals of electricity, titled Basic Electricity and Electronics: DC, has been released.



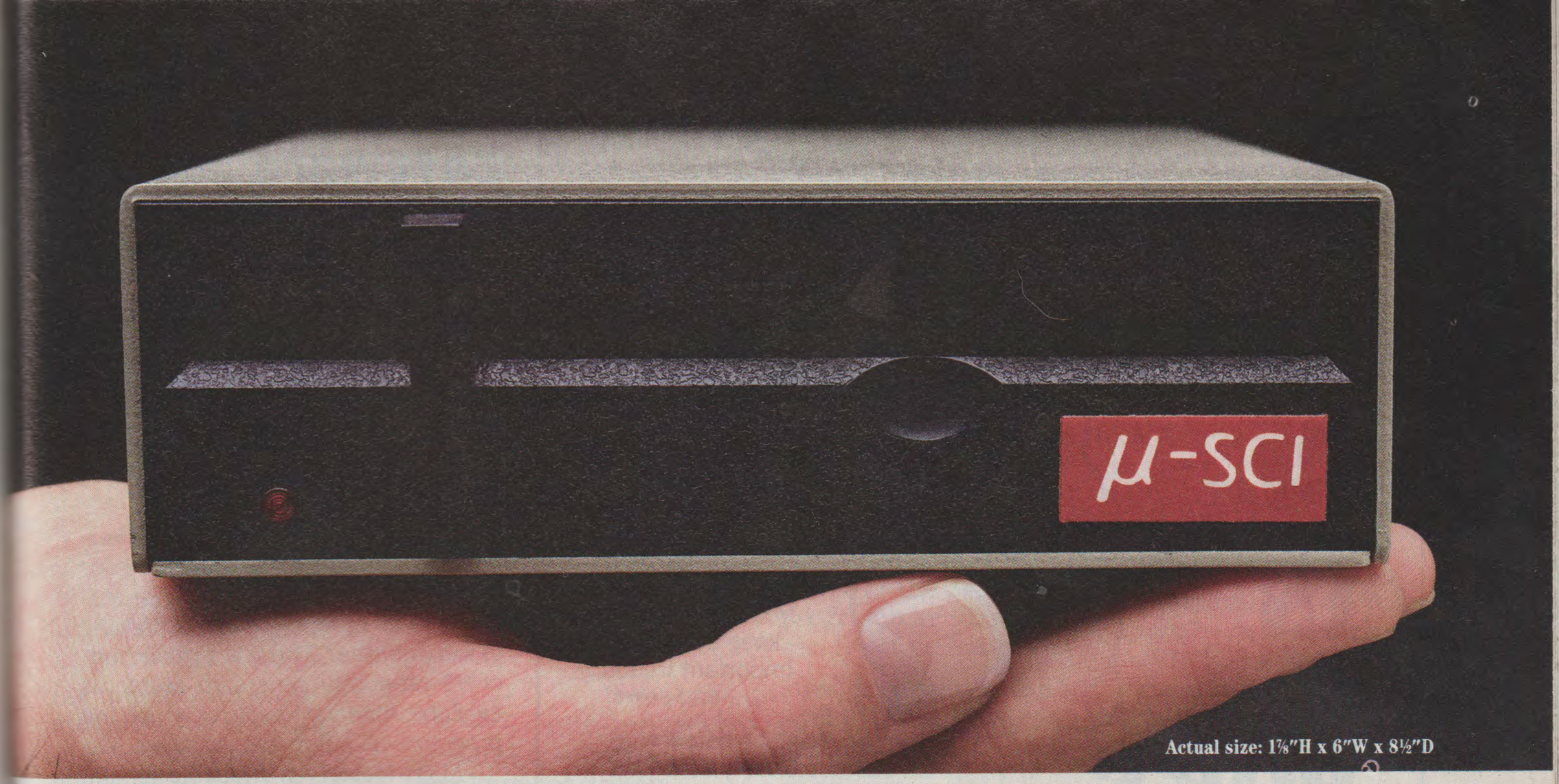
ELECTRICAL CONCEPTS ILLUSTRATED

This Apple-compatible program is self-paced and self-instructional, and is therefore suitable for use both in class and in computer learning labs, according to the publishers.

Basic Electricity and Electronics Explained: DC features high-resolution graphics, text and constructed responses that maintain user involvement. Each diskette's Student Management System allows the instructor to monitor each student's progress while pin-pointing areas of learning difficulty. *Bergwall Electronic Publishing Co., Uniondale, NY.*

Write No. 252 on Inquiry Card

(continued on page 66)



Actual size: 1⅞"H x 6"W x 8½"D

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Finally there's a way to get reliable disk drives at reasonable prices.

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We've got a full selection of Apple-compatible disk drives to fit your needs, a little or a lot.

The A2, our most popular Apple II and IIe-compatible, and the A20, an even better price value, are both direct replacements for the Disk II. Thirty-five-track, 143K drives, they'll easily attach to the Apple Disk II controller. Or interface them with our C2 controller with the unique "jumper" that lets you switch from DOS 3.2 to DOS 3.3.

And for even more capacity, we offer the A80. Featuring a full 80 tracks and 328K.

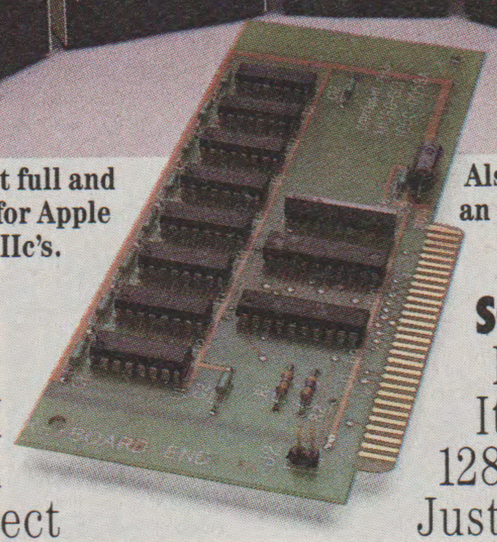
Microsci's A80 also runs utility programs that allow DOS 3.3, CP/M® 2.20B, CP/M 2.23, PASCAL 1.1 and ProDOS™ to take full advantage of its capacity.

And like the A2, both the A20 and A80 can be used with the Apple Disk II controller or Microsci's C2 controller.

Our Microsci A143 is Apple III-compatible and features 140 tracks with 572K of storage. It attaches directly to the Apple III's controller and power supply and takes up no additional slots.

The A143 may also be daisy-chained to allow you up to 1.5 megabytes of storage.

Direct replacement full and half-height drives for Apple II's, III's, IIe's and IIc's.



Also add 80-column display and an additional 64K of memory to the IIe with our 80/64e card.

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Available for the II, IIe and IIc, they're direct replacements for the Apple Disk II and IIc drives.

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Write No. 22 on Inquiry Card

Software *(continued)*

Basic Math Skills Found on Program

Thirty lessons on basic maths skills are featured on a new program called Math Mastery, from Random House.

Lessons include number concepts and addition and subtraction in drill and practice form.

On-screen directions, sample exercises and graphics that illustrate concepts make each lesson easy for students to do independently, according to the publisher. There is a maximum of 99 randomly generated problems available for each lesson, of which the program will automatically select 30.

Math Mastery is available for the Apple II+ and IIe computers. *Random House, Westminster, MD.*

Write No. 244 on Inquiry Card

Organizing Papers Precedes Writing

Writing is Thinking for the IBM PC is the first program to utilize the computer to teach the actual writing process, according to the publishers, Kapstrom, Inc. The software is divided into four sessions of instructions, approximately 45 minutes each, featuring the three stages of writing as stages of problem solving.

Chapter One, Analyze the Problem, presents planning which includes brainstorming and writing opinions as the basis of all papers. Chapter Two, Develop the Structure, presents a second phase of planning which includes selecting the best structure and outlining the main thought pattern of the paper.

Chapter Three, Develop the Structure Part II, is the actual writing, which is made up of paragraphing and writing supportive facts and examples. Chapter Four, Evaluate the Design, encourages rewriting by dividing this task into two parts—revising and editing.

Educational discounts are available for Writing is Thinking, which is compatible with several popular word processing programs. The publisher honors a 30-day refund policy. *Kapstrom, Inc., Dallas, TX.*

Write No. 261 on Inquiry Card

(continued on page 69)

Do it yourself with TEL.

Introducing TEL, a courseware development system so easy to learn and use, you can create sophisticated educational courseware yourself.

The teaching power of the computer.

Computers can individualize the teaching process like no other educational delivery medium. Computers allow students to work at their own rate, to study when their schedules permit, receiving only the instruction they need to maximize learning.

The problem is software.

You're the expert on teaching and on your curriculum. But not on courseware development. Even if you have a programmer on your staff, it can be difficult to develop computer-based instruction. You still have to teach instructional techniques and knowledge of your specific subject to the programmer.

The "practical" solution?

Up to now, there has been only one practical solution: turn over development to a courseware house. But even the best of them don't know your subject area like you do. So you can get a homogenized, generic product. If you want better, the cost in time and effort to train them is often prohibitive.

Expanding your options.

Imagine a software development system specifically designed for instruction. Suppose it was powerful and flexible enough to create sophisticated courseware and keep complete student performance data. But suppose it was also straightforward and easy enough for a novice to learn and use quickly. The instructional courseware development problem wouldn't just be solved . . . it would disappear.

Introducing Regency's TEL.

Regency Systems' TEL System solves the dilemma. Regency has seven years experience in computer-based education and training, and TEL was designed by a team with over 25 combined years of experience in courseware development.

With the TEL System we have moved computer-based instruction into the next generation by creating a sophisticated courseware development system for use by education professionals with little or no programming experience.

TEL has two main components that put the power of the professional programmer into the hands of the instructor:

First, it's a powerful high level language designed specifically for instructional use — not a programming language but a sophisticated courseware development language with commands designed to do what instructors need. Clean and easy to learn, it enables experienced teachers to begin developing powerful courseware after mastering just a few commands. Yet the language is so flexible that its power grows with the experience of the user in easy to master, incremental steps.

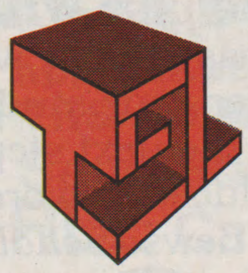
Second, it's an array of fully integrated software tools to aid in the development process, each amply provided with online assistance that makes them easy to use even for the beginner. These include a remarkably uncomplicated text editor that's fully integrated with a powerful graphics editor, a simple system for computer management of student performance data and a file directory that's as easy to use as a phonebook. In addition, TEL has the capability to create special characters and create text in different sizes and styles, and an easily accessed online reference to aid in using the TEL commands.

Best of all, TEL courseware can be delivered on the IBM PC® and compatible machines, or it can be modified to run on your existing hardware.

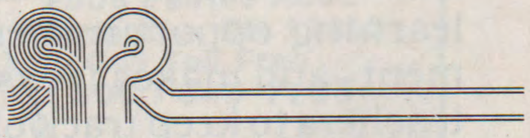
To find out more...

about this breakthrough in instructional software development, call or write Regency Systems for our informative brochure describing the system in complete detail. Find out just how possible — and affordable — development of sophisticated computer-based instruction can be when you do it yourself . . . with TEL.

Complete TEL Systems software and all support materials available January 14, 1985.



Training & Education Language



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Write No. 29 on Inquiry Card

Scholastic Inc. & Software Publishing Corporation invite you to take the next step up in school software!

Almost two years ago, Scholastic first began holding discussions with Software Publishing Corporation, developer of the bestselling *pfs: Software*

We knew that *pfs* was widely lauded as the most powerful, easy-to-use and affordable software for business and home use. We also knew *pfs: Software* was integrated software—and extraordinarily successful. The question was: Could we transform *pfs* into the most effective software for *educational* use?

The initial results of our collaboration have just been published. And they have exceeded our highest expectations:

* ***Scholastic pfs : Write*** is the most sophisticated *and* easy-to-use word processing program you can offer your students in junior high and above. It is the next step up after students have been introduced to word processing. And here's more good news: *Scholastic pfs: Write* is intercompatible with the entire *Scholastic pfs* series.

* ***Scholastic pfs : File*** provides a wealth of learning opportunities in data base management—and makes it easy for administrators and teachers to keep track of a wide range of information. Fortune 500 companies rely on this powerful utility. And now Scholastic has made it *educationally* powerful.

Available for Apple computers and MS/DOS for IBM-PC/PCjr and equivalents.

* ***Scholastic pfs : Report*** sorts data stored in *Scholastic pfs: File*, and presents it in an easy-to-interpret column format.

* ***Scholastic pfs : Curriculum Data Bases for U.S. History, U.S. Government, Life Science and Physical Science*** represent what so many educators have asked for—comprehensive coverage that supports their curriculum areas *and* uses the power of the computer to facilitate learning.

Scholastic has made *pfs* perfect for Schools.

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Without cost, please send me a complimentary *Free Preview Re Form* and complete information about the new *Scholastic pf ware* programs. I understand that savings are available on co purchases of these integrated programs.

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Title_____

School_____

School Address_____

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State_____ Zip_____

Write No. 72 on Inquiry Car

Software *(continued)*

Consumer Finances In Seven Lessons

What are the differences between stocks and bonds? How do you reconcile a bank statement with a checkbook balance? What is the difference between straight commission, straight commission plus salary, graduated commission, or graduated commission plus salary?

These are the kinds of questions students will be able to answer after taking the Consumer Education Program, according to the publishers, BLS Tutorsystems. Seven tutorial lessons cover savings accounts, credit

THINGS CONSUMERS SHOULD KNOW

cards, installment buying, investments, sales commissions, and auto insurance. Each lesson has a Mastery Test and Student Monitor which records performance for up to 50 students.

Pre- and post-tests provide proper placement and accountability. The optional Test Disk automatically diagnoses pre-tests and directs the student to appropriate lessons. Reading level is Grade 6. The programs are available for Apple II and II+ micros. *BLS Tutorsystems, Wilmington, DE.*

Write No. 235 on Inquiry Card

Spreadsheet Offers Pop-Down Menus

A new low-cost spreadsheet program for the Apple IIc, IIe and II+ has been announced by VisiCorp.

Called FlashCalc, the program features variable width columns that allow the user to alter column dimensions according to need, and formatting features that automatically allow the user to set special symbols, such as commas for large numbers.

FlashCalc includes a set of financial functions for determining internal rate of return, net present value, present value, future value, payment, payment periods and interest or discount rates. *VisiCorp, San Jose, CA.*

Write No. 249 on Inquiry Card

Early Learning Skills Get Practice

Providing high-quality curriculum-related activities for elementary schools is the purpose of the Early Learning Series, according to the publishers. Designed for children age 3 to 6, these programs provide practice in fundamental skills.

Skills the software helps develop include exercising creativity and imagination; pattern, color and shape recognition; comprehension; hand-eye coordination; using descriptive language; and using visual and auditory memory. The Early Learning Series Volumes 1 and 2 are now available for Apple II, II+ and IIe computers with 48 Kbytes memory and one disk drive. *Educational Computer Systems Corp., Vancouver, WA.*

Write No. 259 on Inquiry Card

Basic Life Science Explored in Video

An audiovisual program to teach basic life science has been published by Hawkhill Associates in consultation with the History of Science Department at the University of Wisconsin-Madison.

Titled The Gene, the two-part program traces the development of genetic theory from Gregor Mendel to modern recombinant DNA research.

Highlights include color photos of Mendel's now-abandoned monastery garden in Brno, Czechoslovakia, as well as views of modern genetic research labs at the University of Cambridge, England, and the University of Wisconsin.

The Gene is one of 12 new programs in the series, Time, Space, & Spirit — 12 Keys to Scientific Literacy. It is available in sound-filmstrip or in videocassette formats. *Hawkhill Associates, Madison, WI.*

Write No. 246 on Inquiry Card

(continued on page 70)

Software *(continued)*

Free Resources Listed on Diskette

The Free Materials ResourceDisk is a diskette directory of free educational materials. It contains a selective database of 2,000 free items from 250 federal agencies, private companies, and nonprofit organizations.

This database can be searched in three categories: materials format, grade level, and curriculum area. The program integrates a small word processing system to facilitate communications with the agencies and businesses listed.

Subjects covered by the Free Materials ResourceDisk include energy, environment, health, land use, crime, parenting, space and more. The software is available for Apple II+, IIe and IIc computers. *Educational Associates, Phoenix, AZ.*

Write No. 263 on Inquiry Card

Micro Converted to Frequency Meter

Frequency Meter, a laboratory interface program, turns the Apple II+ or IIe into an audio range frequency meter. Sound signals may be fed into the computer using a microphone, cassette recorder and the Apple's cassette input port.

Frequency readings can be displayed in large digits, saved in memory or on disk and graphed. The program includes several options to demonstrate the physics of music.

Using inexpensive circuits described in the 40-page manual, the program can be used to measure temperature, voltage, light intensity or pressure. *Vernier Software, Portland, OR.*

Write No. 248 on Inquiry Card

Vocabulary Builder Has 90,000 Words

Hayden Software has announced Word Challenge, a vocabulary building and skills game that pits the word ability of players of all ages against the computer's 90,000-word dictionary.

Based on the board game Boggle, the compter version allows players to choose one of 26 difficulty levels. The computer also will keep score and can be pre-set with a time limit to generate words from the Boggle-like grid of random letters that starts play.

When the time limit is up, the system automatically checks each user-listed word, submits an additional listing of words the user may have missed, and scores the player's list of words against the computer's dictionary.

Additional play options allow users to select color, rotate or enlarge the word-grid, select scoring methods, or enter their own letter-matrix. Word Challenge is available for IBM, Apple and Commodore personal computers. *Hayden Software Co., Lowell, MA.*

Write No. 260 on Inquiry Card

Alcohol's Effects Explored on Disks

How does group drinking affect behavior? What are the effects of alcohol on brain cells? What is the relationship of alcoholic beverages and automobile accidents? These are the

SHOWS DRINKING RESULTS

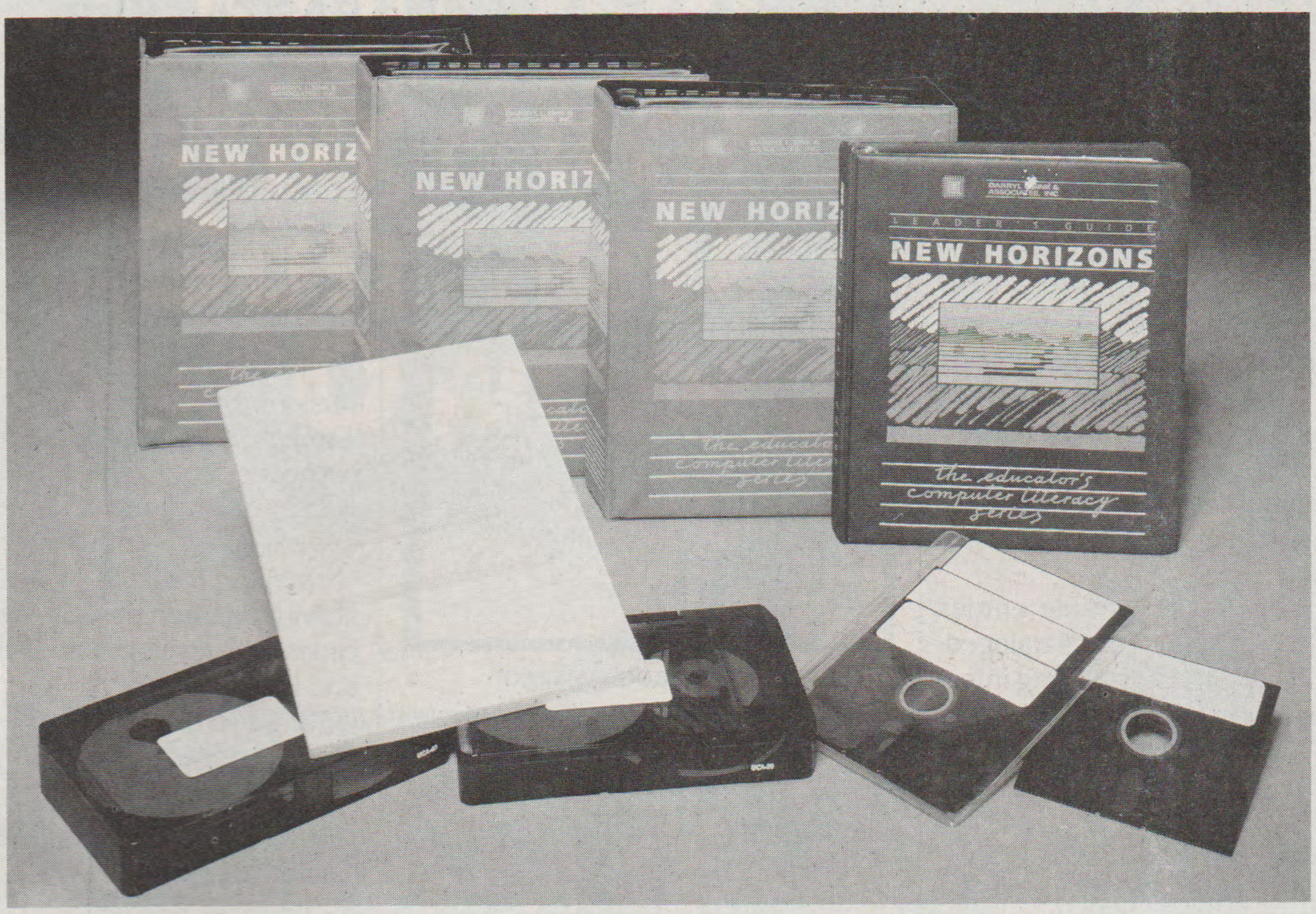
kinds of questions students will be able to answer after taking the Alcohol and Health Program, according to the publishers, BLS Tutorsystems.

Two tutorial disks cover the history of the use of alcohol; societal views towards alcohol, physiological and behavioral effects of alcohol, facts about drinking and driving, alcoholism and laws concerning alcohol.

Each lesson has a Mastery Test and Student Monitor which records performance for up to 50 students. Reading level is Grade 6. The software is available for Apple II and II+ systems with 48 Kbytes. *BLS Tutorsystems, Wilmington, DE.*

Write No. 236 on Inquiry Card

The Answer To Some Important Computer Literacy Questions



How do I use the computer? How do I integrate the computer into my classroom? How do I keep up with everything I need to know about computers? How do I address a parent's concern about their children's level of computer literacy?

These are just some of the questions concerned parents, educators, and administrators face every day as they confront the current explosion in computer technology. **NEW HORIZONS:** The Educator's Computer Literacy Series from South-Western Publishing can provide relevant, uncomplicated answers.

Working in concert, the complete package will give you an immediate, practical hands-on experience.

- **6 Video Tape Presentations**—explain just a few of the endless ways microcomputers can be incorporated into the educational environment
- **15 Interactive Program Diskettes**—demonstrate the kinds of instructional programs that can be easily integrated into any curriculum
- **Fully-illustrated Workshop Leader and Participant Guides**—provide a wealth of activities and supplemental information designed to meet the objectives for each module.

NEW HORIZONS: The Educator's Computer Literacy Series will cure even acute computer phobia.

For more information contact:

Consumer/Professional Products Department
South-Western Publishing Co.

Or Visit us at Booth 1362 at the Commtex International Show

Write No. 77 on Inquiry Card

Books

The Free Software Catalog and Directory

Robert Froehlich
Crown Publishers, Inc.
New York, NY
256 pp., $9.95

The book focuses on the two largest and most readily available free software libraries—the CP/M Users Group and the Special Interest Group for Microcomputers—and provides all the information necessary for educators to take advantage of free software resources.

More than 5,000 disk file entries from 220 library disks are cataloged. Each file has an entry providing information designed to assist in the selection of files potentially suitable for the reader's needs.

The keyword directory indexes alphabetically all files. Each item in the keyword directory includes not only the file's number but also the other assigned keywords.

The language directory allows direct access to source code files by the programming language of interest to the reader. The author directory allows access to all files by author and the file name directory allows direct access to particular files by name.

Write No. 714 on Inquiry Card

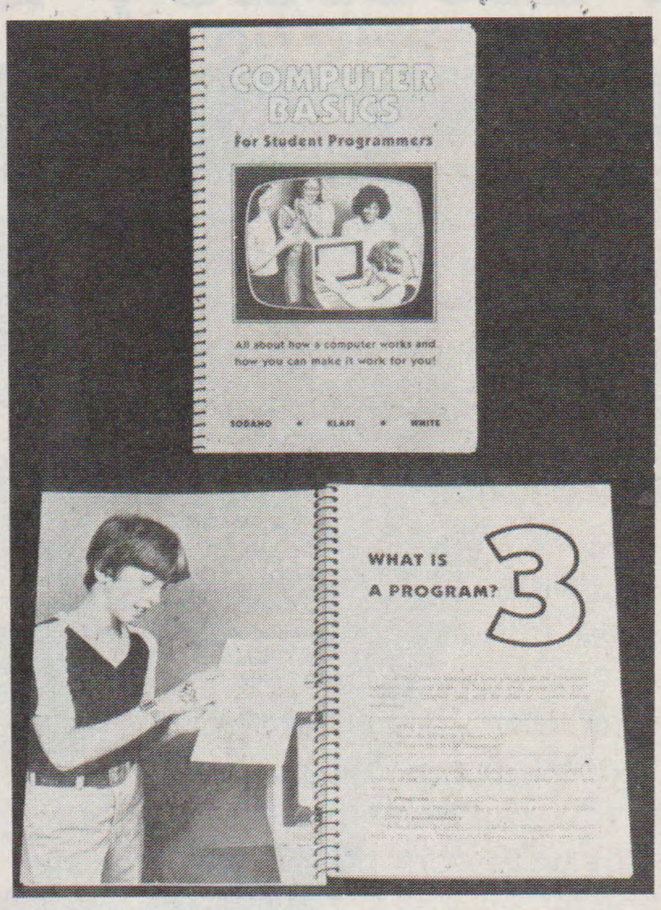
Computer Basics for Student Programmers

D. Sodano et al.
Educational Activities, Inc.
Baldwin, NY
126 pp., $5.95

Computer Basics for Student Programmers is an easy-to-use book on computer literacy and basic programming, according to the publisher.

Introductory sections on the history of computers, the computer system and programs are followed by more specific programming information.

The text is aimed at middle elementary through remedial secondary educational levels, but is also helpful for adults who want to learn about computer programming.



TEACHES PROGRAMMING

The book is not computer specific, but teaches programming concepts universal to all microcomputers. It is also designed to teach programming when there is no computer available for the student.

Write No. 715 on Inquiry Card

Word Processing Supervision

R. Davis & J. Balderston
Bobbs-Merrill Educational Pub.
Indianapolis, IN
$17.96 text
$5.50 instructor guide

Word Processing Supervision is a text designed to prepare students to handle the supervisory responsibility of a word processing center.

Emphasizing function, the book gives students the know-how to develop and implement a word processing operation in any type of business or industry.

The book moves logically from an overview of the supervisor's responsibilities to a graduated, step-by-step analysis of setting up a word processing operation from ground zero. Each chapter begins with a vignette that challenges and motivates as well as provides information on the real world of business.

Discussion questions, vocabulary, and role-playing activities end each chapter, enhancing student learning and assuring their involvement.

Write No. 713 on Inquiry Card

Let's Learn BASIC: A Kids' Introduction to BASIC Programming

Ben Shneiderman
Little, Brown and Co.
194 pp., $8.95

This book is available in separate versions for the Commodore 64, Apple II series, IBM PC/PCjr and Atari microcomputers. No skills beyond third grade reading and arithmetic are required, according to the publisher.

Written for 8- to 14-year-olds, this activity-oriented book uses tested principles of developmental psychology and learning theory in a series of challenges and rewards designed to build confidence and motivate further learning.

Write No. 703 on Inquiry Card

The Energy Management and Control Systems Handbook

F.W. Payne
The Fairmont Press, Inc.
Atlanta, GA
350 pp., $39

The Energy Management and Control Systems Handbook is a reference text to help design and specify energy management systems for maximum cost savings, according to the publisher.

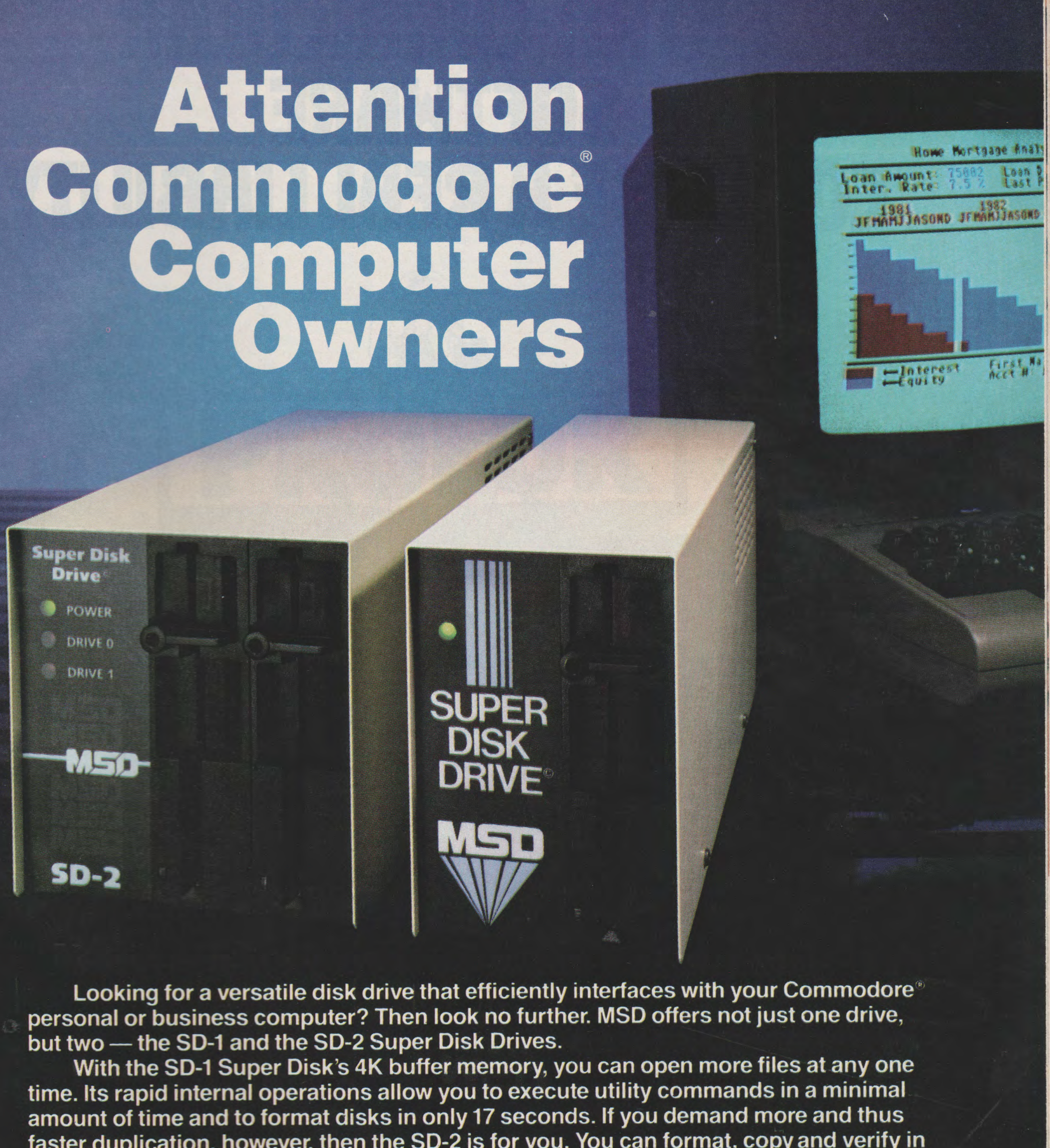
Details are provided on how to select and integrate the optimum system for any size or type of operation and how to avoid common mistakes which can reduce benefits.

Topics include how to design and specify all types of energy management systems; system procurement, installation, fine-tuning and maintenance; training of operating personnel; EMS design guidelines for new buildings; life cycle costing analysis for EMS; and current market overview and technology assessment.

Write No. 702 on Inquiry Card

(continued on page 77)

Attention Commodore® Computer Owners



Looking for a versatile disk drive that efficiently interfaces with your Commodore® personal or business computer? Then look no further. MSD offers not just one drive, but two — the SD-1 and the SD-2 Super Disk Drives.

With the SD-1 Super Disk's 4K buffer memory, you can open more files at any one time. Its rapid internal operations allow you to execute utility commands in a minimal amount of time and to format disks in only 17 seconds. If you demand more and thus faster duplication, however, then the SD-2 is for you. You can format, copy and verify in less than 2 minutes — twenty times faster than if you used two single drives together.

Both drives feature state-of-the-art design for exceptional durability and longer life. Both feature unique vertical loading for greater space savings. And neither will ever overheat.

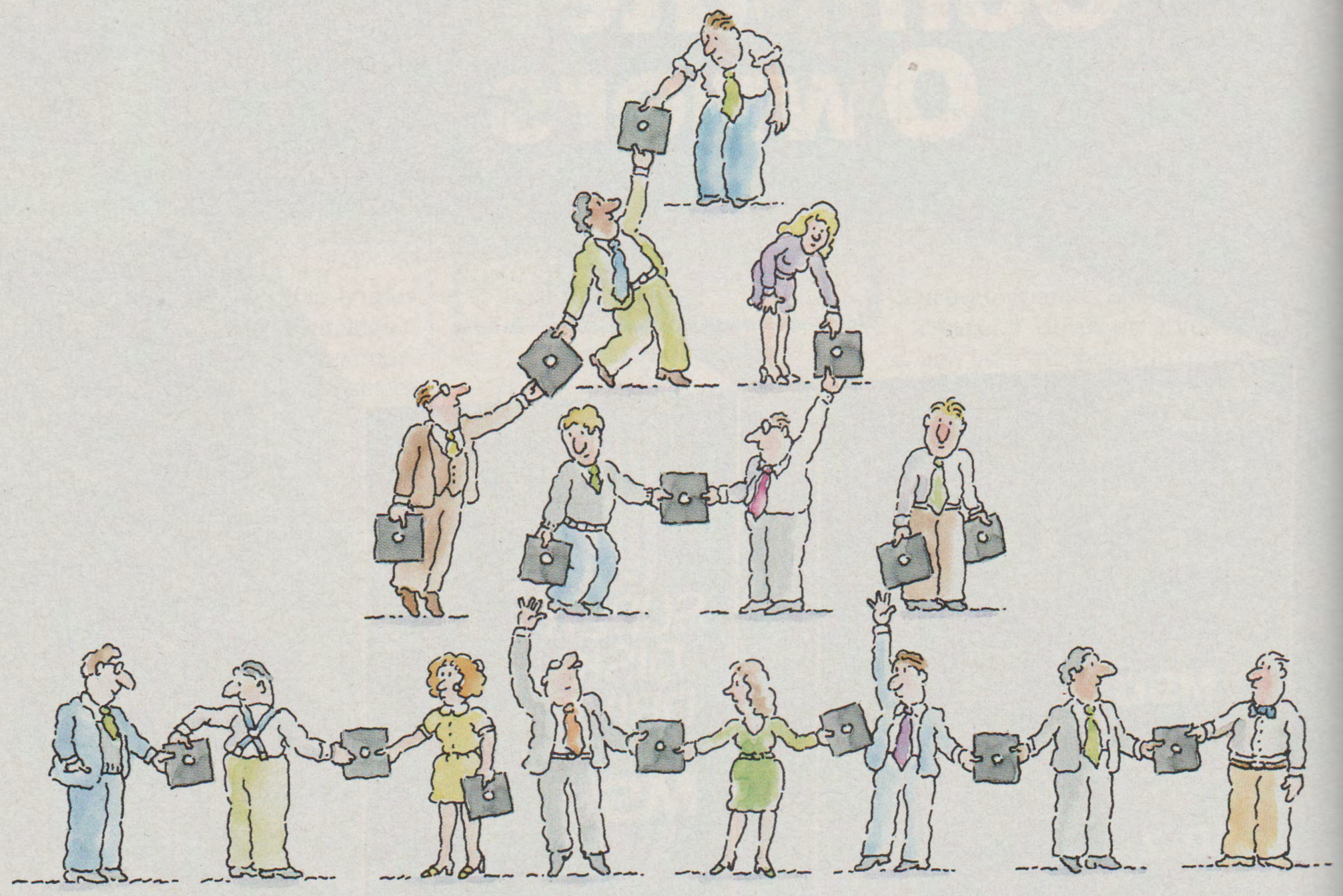
Call MSD today for more information or the location of the dealer or distributor nearest you.

Write No. 25 on Inquiry Card

MSD SYSTEMS, INC.

10031 Monroe, Suite 206 Dallas, Texas 75229 (214) 357-4434

EXTRA-CURRICULAR SOFTWARE COULD BE A REAL LIABILITY.



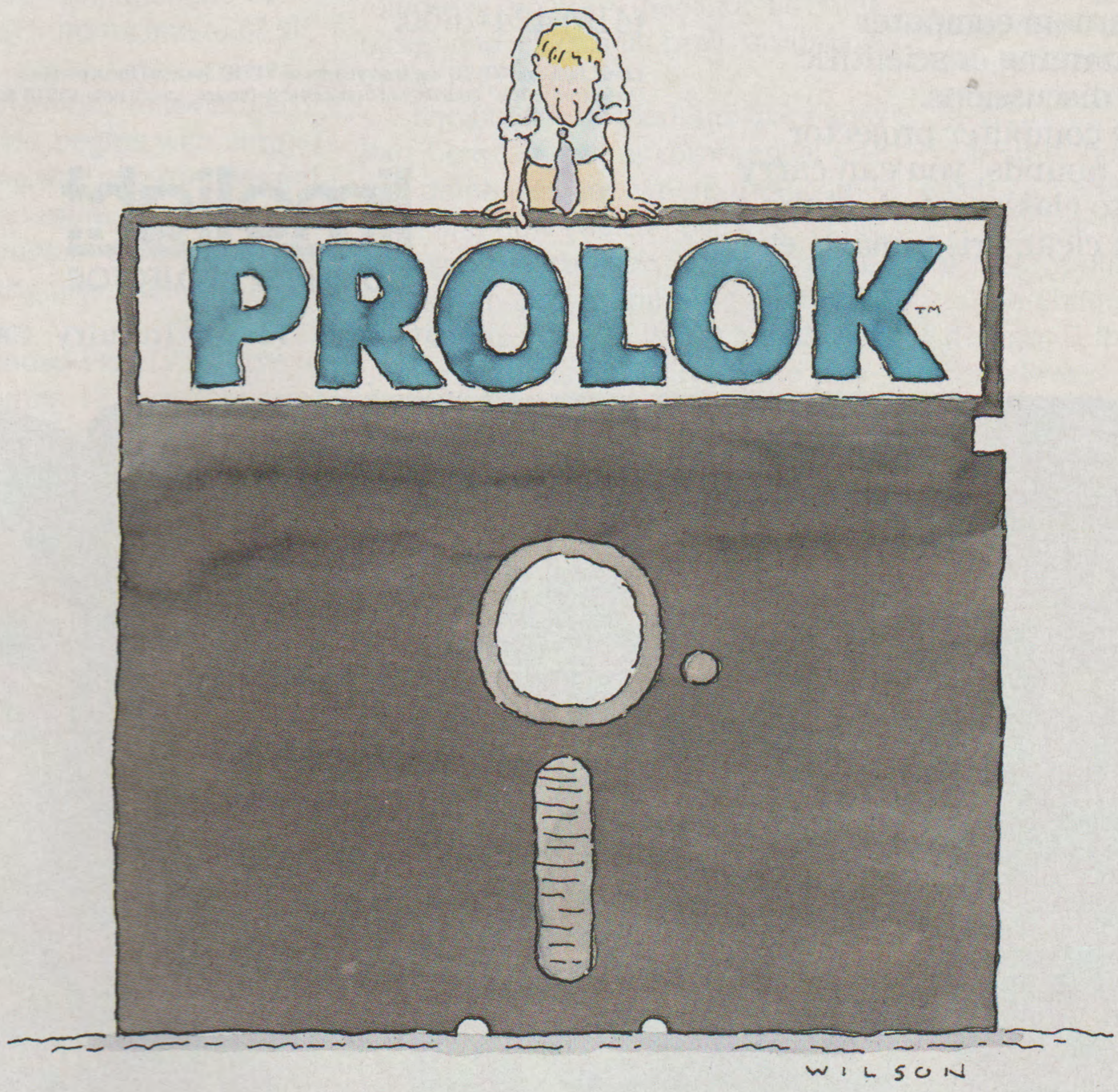
If you don't think so, just ask Rixon Corporation after they recently settled out of court with Lotus Development Corporation. Lotus sued for $10 million after discovering that Rixon was allegedly using unauthorized copies of Lotus 1-2-3®. A hard way to learn a lesson. And an expensive one.

However, there is student-proof way to protect software from unauthorized duplication. And your institution from needless legal liability.

The Prolok™ software protection disk doesn't need add-on hardware. The technology is all on the disk itself. Instead, each disk is marked with a unique, physical "fingerprint." No two are alike. A precise description of the individual print is encoded magnetically and the fingerprint and description must match exactly before the software is decrypted and released to the system. No match, no access.

Its genius is its simplicity and familiarity. Prolok looks like an unprotected disk, loads like an unprotected disk, works like an unprotected disk. And it's as easy to use as A>PROLOK B: filename. Backups are easily made via normal system utilities. However, to be read they must be accom-

PROLOK. SOFTWARE



panied in the system by the original Prolok disk.

Several command line slash (/) options are built into Prolok diskettes for customized security, depending on your institution's needs.

Software can be loaded easily onto Prolok diskettes using any system from a PC to commercial mass duplication equipment.

Prolok is an engineering breakthrough of Vault Corporation, which has been successfully safeguarding software since the inception of security disk technology.

Schools like Harvard, Carnegie-Mellon, NYU, Cornell and Purdue cut their legal liability with some of the cheapest insurance available. Now, you can too.

Simply contact Vault Corporation at 2649 Townsgate Road, Suite 500, Westlake Village, CA 91361. Or if you're in a hurry phone us at 800-445-0193 (U.S.) or 800-821-8638 (California). And do it before your school has to learn the hard way.

Write No. 71 on Inquiry Card

PROTECTION, RIGHT ON THE DISK.

How to share a computer.

It couldn't be any easier.

Just plug the new LimeLight™* computer projector into virtually any classroom computer, turn it on and focus.

It's like having a six foot screen on your computer. So everyone gets a first-class view.

Whatever you create on your computer screen is projected onto any large screen or wall. And of course, every change you make is projected instantly.

You can use the LimeLight computer projector to share any kind of classroom computer application—from programming or scientific simulations to "what-if" discussions.

Because the LimeLight computer projector weighs only twenty-five pounds, you can carry it easily from classroom to classroom. And the rolling screen gives you a clear, crisp image, even in a well lit room.

And for schools only, we have a special offer. We're including a screen *free* for the regular retail price of the computer projector alone.

Which makes our $3950 price tag—for both the screen and the projector—much more affordable than a classroom full of computers.

If you'd like to know more about sharing a computer, just call or write us about a dealer demonstration or more information.

VIVID™ Systems Incorporated,
2440 Embarcadero Way, Palo Alto, CA 94303,
(415) 424-1600.

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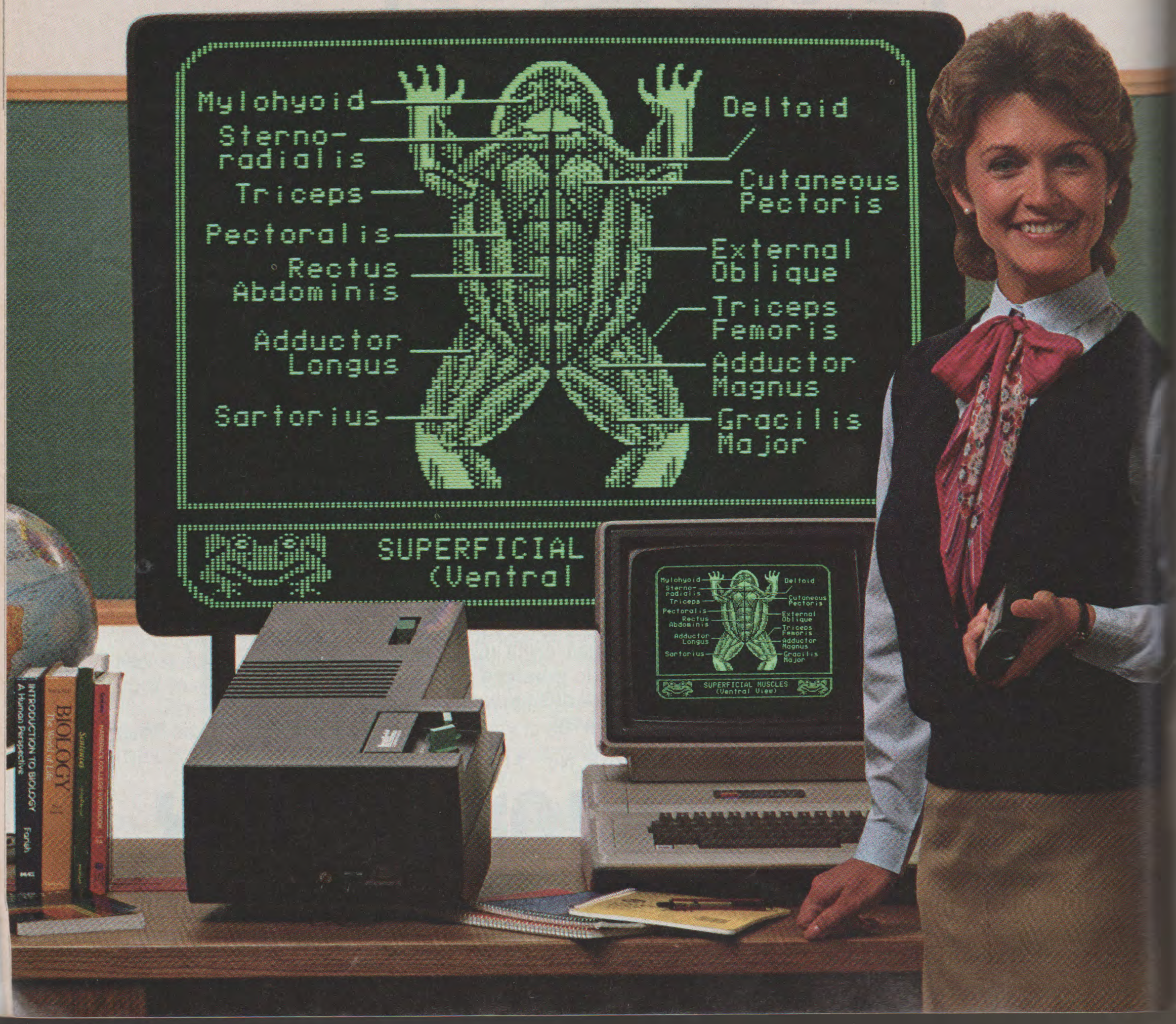
limelight™
COMPUTER PROJECTOR

Write No. 33 on Inquiry Card



Books *(continued)*

Taking Off with BASIC on the Commodore 64

Nancy R. Watson
Robert J. Brady Co.
Bowie, MD
188 pp.

Taking Off with BASIC on the Commodore 64 is an introduction to BASIC programming.

Assuming no prior knowledge of BASIC, this guide begins with simple BASIC statements and commands, and then proceeds to more complex ideas following one program theme throughout—the building and "take-off" of a rocket.

Following those first 17 chapters, there are another 17 supplemental chapters that expand BASIC concepts including a list of the most frequently used statements and commands with page numbers for quick reference; a musical code chart listing two octaves of tones to make use of the sound capabilities of the Commodore 64; and other sections on sound, graphics, and more.

Write No. 739 on Inquiry Card

Applied Apple Graphics

Pip Forer
Prentice-Hall, Inc.
Englewood Cliffs, NJ
340 pp.

This book and the disk provided with it are about microcomputer graphics and their uses, according to the author. While the book works at a practical level with a single machine, the Apple II+, IIe and other compatible models, the general emphasis of the text is on the wider ideas behind graphics use.

The book concentrates on graphics examples using the BASIC language, although it discusses a variety of graphics options.

Included is an overview of the analytic geometry needed for 3-D perspective work, and an introduction of existing software utilities for doing particular jobs quickly, with a particular emphasis on how to evaluate such packages.

There is also a discussion of upgrading your graphics with new hardware and new languages.

Write No. 732 on Inquiry Card

Databasics

D. Howitt & M. Weinberger
Garland Publishing, Inc.
New York, NY
614 pp., $16.95

Databasics is both a how-to and a reference book in the area of databases and electronic mail, according to the publisher.

The book is divided into five parts. Part I explains what commercial on-line databases are, where they come from and how you can use them. Part II describes business-oriented databases with an in-depth study of 100 of the approximately 2,000 databases on the market, according to the publisher.

Part III presents several dozen database vendors. Part IV discusses the kinds of hardware and software usable for on-line communications. Part V explores the future of the on-line industry, taking a look at the kinds of services that today's databases are evolving into, paying attention to the applications of artificial intelligence.

Write No. 731 on Inquiry Card

A Guide to Programming in Applesoft (2nd Edition)

Bruce Presley
Lawrenceville Press, Inc.
Lawrenceville, NJ
$16.50

Designed for secondary schools and colleges, the second edition of this text offers new chapters on programming techniques and advanced topics.

In addition to teaching good programming techniques essential to writing logical programs, the manual also features review exercises in each chapter and comprehensive problem sets which offer the student programmer an opportunity to try out newly learned skills, according to the publisher.

Appropriate for students with a wide range of backgrounds, this manual is structured in that topics are discussed individually so that students may select the sequence that interests them.

Individual chapters are devoted to programming techniques, color graphics, mathematical functions, data types and the disk operating system.

Write No. 742 on Inquiry Card

Computer Kids

George Sullivan
Dodd, Mead & Co.
New York, NY
127 pp., $10.95

In this book, students from the East Coast and California's Silicon Valley discuss their relationships with microcomputers.

The children, four boys and four girls, ages 11 through 16, represent different levels of computer skill and experience.

They answer questions about their first experiences with computers, what they do with them, what they like and dislike about computers, and what advice they are willing to pass along to other youngsters on the subject.

Write No. 737 on Inquiry Card

IBM PCjr: Introduction, BASIC Programming and Applications

Larry J. Goldstein
Robert J. Brady Co.
Bowie, MD
386 pp., $14.95

This text is aimed at novices, potential buyers and existing owners of the IBM PCjr microcomputer, and covers the programming capabilities and applications of the machine.

The book includes an outline of what the PCjr will do and how it works; a treatment of DOS and PC BASIC with tips on easing programming frustrations; a discussion of graphics, sound and file handling; applications to business, games and word processing; coverage on structuring, planning and debugging programs; tables, charts, appendices; and more.

Write No. 738 on Inquiry Card

(continued on page 78)

Books *(continued)*

1984-85 International Micrographics Source Book

Microfilm Publishing Co.
New Rochelle, NY
328 pp. $65 (U.S.)
$76 (Canada) $80 (S. America)

The 1984-85 International Micrographics Source Book gives the sources of supply and key data for every important micrographic and equipment category. It is set up to be used for a 24-month period, according to the publisher.

It follows a keyword index that simplifies reference. At a glance, readers can find out who makes what, where they are, whom to contact and what the product will cost.

Also included is an industry-wide name and address section; listing of service companies and their services; guide to consultants and their specialties; list of micropublishers and their products; directory of associations and their officers; bibliographies; rundown of COM recorder characteristics; and more.

Write No. 717 on Inquiry Card

Understanding Computers

G. Hopper & S. Mandell
West Publishing Co.
St. Paul, MN
490 pp.

Co-authored by Commodore Grace Hopper, USN, who assisted in programming the Mark I, the world's first large-scale digital computer, this textbook covers technology, applications, and programming of computers.

The book contains real-world motivational examples for students, with profiles on industry leaders and articles on current events related to computers in society.

Throughout the text there are marginal definitions to assist the student. At the conclusion of the chapter material, there is a point-by-point summary followed by review questions and discussion questions.

Write No. 718 on Inquiry Card

The Super Computer Snooper Commodore 64

Isaac Malitz
Datamost, Inc.
Chatsworth, CA
206 pp., $14.95

In this book, the reader learns how the Commodore 64 computer works. It traces the path of a character from the keyboard to areas of memory, to the disk, and onto the screen and printer.

The students will find out how to restore a program that has been erased accidentally, how to "listen" to the inner workings of the Commodore 64, how to identify deleted or hidden files on a disk, and how to write a program which re-writes itself, according to the publisher.

Also covered in this text is the memory, screen, programs and variables, keyboard, disk, graphics, and sound for the Commodore 64.

Write No. 722 on Inquiry Card

(continued on page 81)

"Liberal Arts students need computer power, too."

Dr. Dean Hubbard
President, Union College
Lincoln, Nebraska

Union College, a church-affiliated liberal arts school of about a thousand students, has installed a computer terminal in every dormitory room. Here's what Dr. Dean Hubbard, president of Union College had to say:

"The computer is a tool whose use should not be limited to only those students at technically-oriented colleges and universities. The students at Union College and all college students can and should benefit from programs that build the computer awareness and literacy that is so essential today in business and in everyday existence."

After an extensive evaluation, the school installed ADDS (Applied Digital Data Systems) terminals in 400 dorm rooms and in separate computer rooms for non-resident students. The terminals access the school's Hewlett-Packard 3000 Series 44 mainframe computer. Why terminals instead of personal computers?

"The overall expense of the ADDS terminals," said Dr. Hubbard, "was only a fraction of what it would have cost for personal computers with comparable capabilities. This allowed us to provide computer power to students without extra charges by absorbing the expenditure into our regular tuition rates. The terminals also have the ability to communicate with other campus terminals and faculty data bases. The ADDS terminals offered us the best combination of power, reliability, service and price of any of the systems we investigated."

For more information about how your school can use ADDS terminals to provide low cost computer power to your students, contact Vincent J. Ebbitts, Educational Marketing of ADDS at the address below.

ADDS
Applied Digital Data Systems Inc.
100 Marcus Blvd.
Hauppauge, New York 11788
Tel. (516) 231-5400

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Applied Digital Data Systems Inc.
A Subsidiary of NCR Corporation

Write No. 57 on Inquiry Card

PRESTO. CHANGO.

3M CAN SHIP SCOTCH® LASER VIDEODISCS THE *SAME* DAY AFTER APPROVAL OF MASTER TAPE.

Imagine getting your laser videodiscs mastered and replicated with the speed of same-day photo-processing. If 3M receives a master tape by 8:30 a.m. on a working day and approves it, we'll ship up to 10 of our one-sided laser videodiscs that same day. 3M also offers 1 and 3-day turn-around on orders of up to 50 and 150, respectively.*

As a specialist in laser disc mastering and replication, 3M can provide quality and service second to none. And we can offer the same quick turnaround whether your master tape is 1" type C or ¾" professional tape, produced to 3M specifications. That's what you'd expect from the leader in laser disc technology.

Talk to us about still-frame audio. For programs which require compressing up to 10 seconds of audio into each video frame, 3M offers the EECODER™ still-frame audio system by EECO.® This patented system can encode up to 150 hours of audio on each side of a 30-minute videodisc. That's five times more than any other method of audio compression. To play still-frame audio, add the EECO VAC-300 Still-Frame Decoder to your interactive videodisc system. It's now available from 3M sales representatives.

Send for our free brochure. Find out how Interactive Scotch Laser Videodiscs are being used for training, sales and education. Write: "Videodisc," Optical Recording Project/3M, Dept. J, 223-5S 3M Center, St. Paul, MN 55144.

**Expedited service requires as little as 2 weeks notice for scheduling, credit approval and packaging. Allow 3-6 weeks for special packaging.*

3M hears you...

3M

Books *(continued)*

Science Computer Programs for Kids and Other People

Tom Speitel et al.
Reston Publishing Co., Inc.
Reston, VA
146 pp., $9.95

This book is designed for students in Grades 6 through 12. It is intended for self study but may also be used in classroom and science fair settings, according to the publisher.

All programs in the book run on AppleSoft BASIC.

The book is not designed for children to use in a drill and practice mode along with their computer. The authors feel that drill and practice is the most trivial use of the computer by students. In this book the program listings allow the child to make use of the computer's special capabilities, according to the publisher.

Write No. 723 on Inquiry Card

Networking IBM PCs: A Practical Guide

Michael Durr
Que Corp.
Indianapolis, IN
240 pp., $17.95

Que Corp.'s new book, Networking IBM PCs: A Practical Guide, is for managers who need to know how to select, install, use and manage local area networks.

Written specifically about networks for IBM Personal Computers and PC compatibles, Durr's book is a how-to guide addressing these and other related issues.

The book first presents a general overview of networking and weighs the risks and benefits of office automation. The author supplies information to help managers evaluate, select and configure a local area network for their particular needs.

Other topics covered are network standards, security issues, hardware organization, software products, and network maintenance. The author explains how to develop a buyer's checklist and reviews major network systems currently available for IBM PCs and compatibles.

He describes the ways PCs can access the mainframe computer while functioning within a local area network. Electronic mail, a software applications package that permits communications among people who use the network, is explained. A glossary and a vendors directory are also included.

Write No. 705 on Inquiry Card

Complete BASIC Programming

Steven L. Mandell
West Publishing Co.
St. Paul, MN
349 pp.

Complete BASIC Programming addresses the problem of lack of controls on the implementation of the language following its tremendous growth outside of education, according to the author.

Although there is a national standard version of BASIC, it is normally not followed by computer designers. There are differences in the BASIC language found on various computers.

The material in this book not only presents BASIC found on DEC mainframe computers, but also includes coverage of microcomputer implementations such as Apple, IBM, PET/Commodore 64, and TRS-80.

Write No. 719 on Inquiry Card

Teleconferencing Technology and Applications

C. Olgren & L. Parker
Artech House, Inc.
Dedham, MA
350 pp., $45

Teleconferencing Technology and Applications is a shopper's guide to the technology of teleconferencing, how the technology is being applied and the major trends shaping the future of teleconferencing.

The book includes applications of teleconferencing in more than 160 organizations and 25 detailed case studies.

Covered are all available systems, not just video systems, according to the publisher.

Write No. 710 on Inquiry Card

Handbook of BASIC for the Commodore 64

F. Mosher & D. Schneider
Robert J. Brady Co.
Bowie, MD
359 pp.

Handbook of BASIC for the Commodore 64 is both a reference manual that provides a formal description of each BASIC statement, and a textbook intended to be read from beginning to end, according to the authors. They say that the book has the organization and depth of a reference manual while providing the motivation and applications found in textbooks.

The BASIC language, as enhanced for the Commodore 64, has a repertoire of more than 60 statements, functions and commands. Most of these have numerous extensions and variations. The authors discuss them in their most used forms before proceeding to their subtler and more sophisticated variations.

Write No. 721 on Inquiry Card

Easy Interfacing Projects for the VIC 20

Jim Downey et al.
Spectrum Books
Englewood Cliffs, NJ
164 pp., $10.95

Easy Interfacing Projects for the VIC 20 is written as an introduction for those inexperienced in interface hardware design, according to the authors.

The book begins with elementary concepts and builds from there. The authors recommend the book as a teaching guide for those who want to find out more about computer hardware.

Chapter titles include Computer Fundamentals, Using Machine Language in the VIC 20, The 6522 VIA, Speech Synthesis, Mechanical Actuators, Analog-to-Digital Conversion, Programming Eproms, Interfacing a Parallel Printer, The Game Port, Using the RS-232 Port on the VIC 20 and Modems and the VIC 20.

Write No. 728 on Inquiry Card

(continued on page 82)

Books *(continued)*

Elements of Digital Satellite Communication, Volume 1

William W. Wu
Computer Science Press, Inc.
Rockville, MD
607 pp., $44.95

This text is the first in a two-volume set. It concentrates on the essential elements of communication via satellites and on issues in digital transmission such as the methods of power and bandwidth conservation, operation efficiency, transmission reliability, signaling enhancement, message security, network structures and strategies for optimal planning.

The book serves a three-fold purpose, according to the publisher. It explains what can be done to improve system performance, efficiency and satellite resource conservation when the obvious technological aspects have reached their physical or economic limits; it provides the theoretical background so that practical solutions to problems can be achieved; and it demonstrates how other disciplinary studies can be usefully applied to the design, planning and operation of digital satellite communications systems.
Write No. 720 on Inquiry Card

Evaluating Telecommunication Technology in Medicine

David Conrath et al.
Artech House, Inc.
Dedham, MA
225 pp., $50

This book reports the results of a research project at the University of Ontario and The University of Toronto which studied the relative merits of various teleconferencing systems to deliver medical care to areas far from hospitals.

Evaluating Telecommunication Technology in Medicine looks at four methods used to examine patients from a distance: two-way color television; two-way black and white video; two-way slow-scan video; and hands-free telephone.
Write No. 709 on Inquiry Card

Numerical Analysis

H.R. Meek
Spectrum Books
Englewood Cliffs, NJ
205 pp., $14.95

Numerical Analysis introduces the reader to scientific programming in the BASIC language. It is suitable either as a self-study or as a textbook for a college course, according to the publisher.

The emphasis throughout the book is on writing computer programs to solve scientific problems, not on the theoretical foundations of numerical analysis. However, the numerical methods are explained as they are used.
Write No. 727 on Inquiry Card

Simple Interfacing Projects

Owen Bishop
Spectrum Books
Englewood Cliffs, NJ
168 pp.

Simple Interfacing Projects offers step-by-step instructions for more than ten interfacing projects which can be accomplished on any microcomputer, according to the publisher.

Also included are guidelines for testing, troubleshooting, and programming as well as flowcharts.

Projects include an electric kettle controller, real-time clock, music generator, ROM board, mains remote control, voice-operated controller, sound processor, digitizer pad, telephone modem and alarm clock timer.
Write No. 726 on Inquiry Card

Using Symphony

G. LeBlond & D. Ewing
Que Corp.
Indianapolis, IN
736 pp., $19.95

Written as a guide to Symphony, the integrated software package from the Lotus Development Corp., the book contains 22 pages of color screen photos in addition to 320 black and white CRT shots to show the reader what Symphony can do, according to the publisher.

The authors explain the program's five applications: spreadsheet, word processing, data management, graphics and communications.

Expanded or changed aspects of Lotus 1-2-3's spreadsheet, graphics and data management are also examined and highlighted. A 1-2-3 and Symphony cross-reference helps readers with tasks such as editing 1-2-3 macros to be used on Symphony.
Write No. 716 on Inquiry Card

LOGO: MIT LOGO for the Apple

Rick Billstein et el.
Benjamin/Cummings Publishing Co.
Menlo Park, CA
350 pp.

This book is geared to teach elementary and high school teachers how to teach LOGO, according to the publisher.

A disk is included with six LOGO games and program solutions to half the exercises in the text.

Chapter titles include LOGO: A Beginning; Teaching the Turtle; Procedures with Variables; Recursive Procedures; The Coordinated Turtle; Using Arithmetic Operations in Procedures; Applications of Turtle Graphics; and An Introduction to List Processing.
Write No. 701 on Inquiry Card

Computer FUNdamentals

B. Kurshan & N. Healy
Reston Publishing Co.
Reston, VA
208 pp., $16.95

This workbook provides a fun way to teach young children about computers and how they work.

These classroom-tested activities keep children's attention by using readily available items. In many cases, an actual computer isn't even needed.

Computer FUNdamentals includes a resource section which lists computer books, magazines, games and software available for youngsters and computers.
Write No. 750 on Inquiry Card

Advanced BASIC Step by Step

V. McDermott & D. Fisher
Computer Science Press, Inc.
Rockville, MD
315 pp., $29.96

Advanced BASIC Step by Step is written in a textbook format so that it can be used at the high school or junior college level without supplementing or altering the material, according to the publisher.

The text addresses the more advanced features of BASIC in a format that works well in a classroom setting. Topics are presented a few at a time, followed by skill development exercises that allow the student to become proficient in using new concepts before advancing to more complex topics.

Although only the Apple II+, Pet, TRS-80 and IBM PC computers are specifically addressed in the text, most computers are similar to one of four, so the material may be adapted for the computer being used, according to the publisher.

Write No. 751 on Inquiry Card

Computers in the Classroom A Survival Guide for Teachers

S. Radin & F. Lee
Science Research Assoc., Inc.
Chicago, IL
282 pp.

This book is intended to serve teachers in Grades 4 through 12, according to the publisher.

It is divided into three sections. Section I is devoted to computer literacy. This topic is subdivided into four basic units: the physical, social, historical and programming aspects of computing.

Section II explores data file management. This section introduces computer software that can help with administrative and word-processing tasks.

Section III gives guidelines for setting up a computer lab. This section discusses funding as well as the successful use of community resources to build and expand such a facility.

The book concludes with analysis of hardware and software needs of all school levels in the four primary areas of computer education.

Write No. 749 on Inquiry Card

The Software Writer's Marketplace

D. Joyce & J. Pickering
Running Press
Philadelphia, PA
160 pp., $9.95

Using actual responses from leaders in the software industry, The Software Writer's Marketplace provides authors with information on what kind of programs will sell.

The text covers topics such as: creating your original program; researching the market; writing your documentation; and connecting with the companies most likely to buy your software.

According to the publisher, the book explains when, and when not, to employ multiple submissions; how to write a query letter that's sure to get attention; and how to read a software contract.

Listed are hundreds of software companies, addresses, and telephone numbers, along with a name to contact and a brief description of what the company needs.

Write No. 736 on Inquiry Card

Turtlesteps

Pamela Sharp
Robert J. Brady Co.
Bowie, MD
194 pp.

Turtlesteps is an introduction to Apple LOGO and Terrapin LOGO designed for children with little or no prior computer experience, according to the publisher.

Each chapter is presented in a series of small, logical steps, each linked to a hands-on computer activity. These steps include Big Ideas, which are chapter overviews; New Skills, which are step-by-step tutorials for LOGO skills; and Think and Practice, which are review sections with new problems that can be solved by experimenting with LOGO commands.

The book also includes Sidesteps sections that offer additional LOGO games and exercises; complete coverage of LOGO's graphics commands, editing commands, the keyboard, and use of the disk to store and retrieve programs; a glossary of terms; index; and a tear-out command summary chart.

Write No. 740 on Inquiry Card

Micros in the Primary Classroom

Ron Jones et al.
Edward Arnold Publishers
104 pp., $9.95

Classroom computer literacy from a British point of view is presented in Micros in the Primary Classroom.

Edited by educators in England, they tell of their experiences with structured reinforcement in spelling and mathematics.

Details of more sophisticated information-handling exercises are illustrated with a project using Victorian census data.

Three chapters are devoted to the development of problem-solving skills using both simulations and robots including the Turtle and the BBC Buggy.

Write No. 725 on Inquiry Card

The Power of: AppleWorks

Robert E. Williams
Management Information Source
Portland, OR
232 pp., $19.95

The Power of: AppleWorks is a book designed for users of the AppleWorks program who have little or no experience using a computer, according to the publisher. AppleWorks is an integrated program with word processing, spreadsheet and database applications.

The word processing section allows educators or students to create documents and print them out in any style. The spreadsheet section enables the user to enter formulas and perform calculations. The database section enables the user to organize a file, then print out information in a list form.

Write No. 734 on Inquiry Card

Applications

Five User Branches Grow in W. Hartford

by Bob Rhein

At the University of Hartford in West Hartford, Conn., it was either enter the computer age or be left behind. This reality preyed upon the minds of the university's board of regents who didn't waste any time deciding on the right course of action.

USER BRANCH AT UNIVERSITY OF HARTFORD

With more than 9,000 students in eight schools on campus, most of whom were hungry for the taste of high technology, providing access to those students wishing time on a terminal or a microcomputer was going to be a challenge.

The challenge was met head-on with the construction of five user branches where any student or faculty member with the University of Hartford I.D. card could reserve time or take pot luck on any one of the 75 IBM PC, DEC Rainbow, Apple or Radio Shack microcomputers, or the 55 terminals connected to a DEC VAX-11/70 minicomputer.

"We consider these user branches a resource not unlike the library," says Steven Rothman, manager of user services at the university. And, not unlike the library, there is no additional cost to the students or faculty for availing themselves of the service. "We feel that a system that demands no chargeback is in the university's best interests," Rothman says. The user branches were built entirely out of the university's funds and are supported solely through tuitions.

Open 'Round the Clock

Most of the user branches are open 16 hours a day and usually five to seven days a week. One branch is available 24 hours a day so that students can work in the middle of the night if they want to—or have to.

Of course, peak hours occur between 10 a.m. and 5 p.m. Access to a micro or terminal can be ensured by reserving a space for one hour a day. One half of the stations in any branch can be reserved, Rothman says.

At the beginning of each semester, students or faculty members wanting to use the university's computers sign up at the main user center and are assigned a file number in order to access the minicomputer. Disks with word processing programs, spreadsheets, CAD programs, etc., can also be checked out from part-time user assistants stationed in each of the user branches.

Rothman employs 30 full-time students, usually advanced computer science students or engineers or business students interested in computers, to help out in the various branches.

"Machines can be cold; students need to turn to a person for help," Rothman philosophizes. "I try to get a human being on duty whenever possible."

The user assistants are, however, only the first line of support available to those needing assistance, Rothman points out. In addition to the assistants there are senior user assistants who are available on a more rigid schedule of 40 hours per week and are usually juniors or seniors with a lot more experience with computers.

Backing the senior assistants is the entire staff of the university's computer department who are always glad to answer questions, Rothman says.

Appeared Four Years Ago

The user center and its branches appeared about four years ago after the decision was made by the board to wholeheartedly bring computers into the university as learning and teaching tools.

The dean of arts/sciences, Jim Vinson, a physicist with a background in computers, lobbied the board to appoint Dr. Fred Streifler, a faculty member in the math/science department, to the position of Director of Academic Computing.

Striefler, working with the computer services department, studied the market and selected the DEC VAX-11/70 minicomputer to serve as the university's primary computer system.

"As we matured, the engineering school needed access to the computer for graphics, so lines and terminals went into engineering and a user branch was established there," Rothman says. In the months that followed, the arts/sciences school, the business college and the technical college all needed terminals and micros and a proliferation of user branches grew.

'More, More, More'

As the students and faculty members matured in their approach to the computer on campus, there were relatively few problems.

"All we hear is, 'More, more, more,'" Rothman reports. "The demand is there, and the demand will continue to grow."

In recent months, Rothman found he had to expand the size of two of the branches in order to accommodate the demand. Additional carrels were added. They were enclosed for relative privacy and concentration. The sides of the carrels were carpeted to

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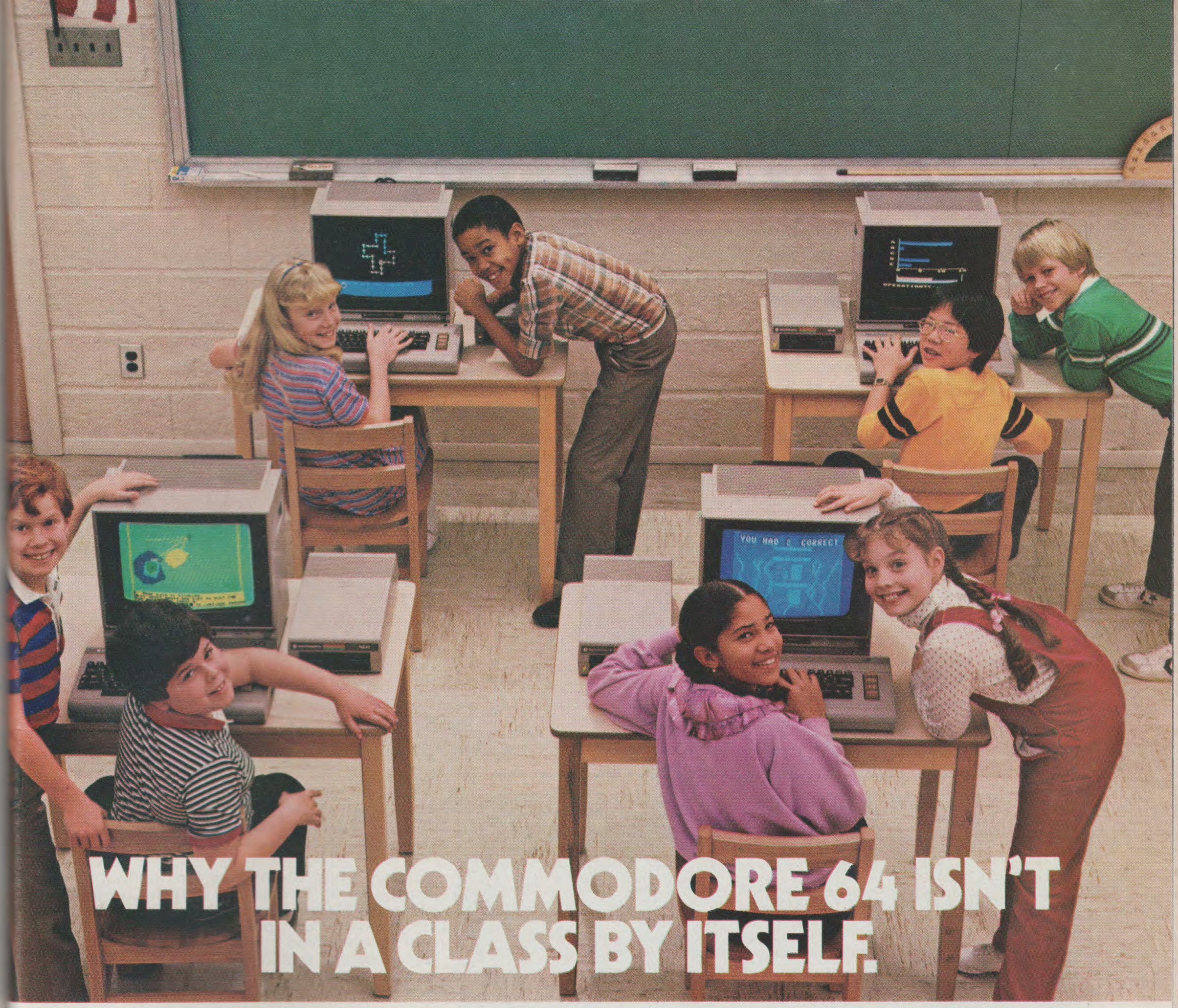

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Applications *(continued)*

dampen noise. A 2″ drop ceiling was also installed to help cut down on noise, and an independent air handling system was added to facilitate the "after-hours" aspects of the user branches without having to expend energy on the entire building. The rooms were illuminated with indirect lighting, while direct lighting was focused on individual workstations. The walls were even painted a soothing light blue to be easy on the eyes.

Write No. 602 on Inquiry Card

CAD Requirements Scare Instructors At Vo-Ed Institute

"Frightening" is the word Senior Instructor Roger Clark used to describe the results of a 1983 survey taken by Texas State Technical Institute, a two-year, state supported vocational/technical school in Waco, Texas. Each of the school's fields of study, called "Technologies," annually surveys industry to determine what is expected of TSTI graduates, Clark explained. And the 1983 survey by the Drafting and Design Technology indicated that employable DDT graduates should have hands-on experience with CAD—computer-aided drafting.

What frightened Clark and other DDT instructors was, Clark said, "the cost involved to implement industry's requirement that CAD be inserted into the curriculum." Thinking CAD training could only be provided on the large mini and mainframe systems actually used in industry, the instructors knew that such a dedicated system could cost hundreds of thousands of dollars.

Nevertheless, research into the available hardware and software was begun by instructors from both the Drafting and Design Technology and the Computer Science Technology. Literature from various vendors of CAD systems was solicited and studied, and demonstrations of packages offering the best price to performance ratios were arranged.

"There was some consideration given to using microcomputers," Clark recalled of the team's research, "but the software available either was not of sufficient quality to use in a professional drafting environment or it was so costly that the price of a workstation approached that of a dedicated system."

With the group on the verge of choosing a dedicated CAD system from a well-known manufacturer, one of the team members saw an ad in a computer magazine for a software package that professed to enable an IBM PC or compatible to become a CAD workstation.

"The ad was considered to be almost a joke," according to Instructor Lance Zimmerman. Wanting to make sure all possibilities were exhausted, however, the team contacted AutoDesk Inc. of Sausalito, Calif., publishers of the AutoCad software described in the ad. A demonstration disk was sent to the school, additional memory was added to the school's computer to achieve the 192 Kbytes minimum required to run the program, and a

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Write No. 28 on Inquiry Card

Applications *(continued)*

test was performed.

"The program lived up to all the claims the ad had made," Zimmerman said. "Here was a program that would run on a microcomputer and fully simulate at least 80 percent of the capabilities of a dedicated minicomputer."

It was the software's advanced drafting extensions that made the team members decide that a microcomputer running it became, "a fully professional CAD station." Zimmerman named capabilities such as automatic dimensioning, fillets, automatic crosshatching, and the creation of blocks (shapes) as features that led the team to decide they could teach necessary CAD job skills on microcomputers. The software also allows the draftsman to create his or her own library of frequently used symbols or shapes and to customize the menus for each particular drafting discipline.

"The implications were obvious," Clark said. "Using AutoCad would allow the cost of a workstation to drop from $50,000 or $70,000 to as little as $10,000."

The CAD courses have been taught, on microcomputers, for three quarters. "They have been very successful," Clark reports, "and the evening course is one of the most requested of the continuing education courses, mostly by professional draftsmen wanting to upgrade their skills."

The Drafting and Design Technology at TSTI has since set up a research center specializing in computer-aided drafting on both large and small systems. IBM has donated a Fastdraft system and Texas Instruments has donated a TI Professional Computer with voice input. DDT is currently exploring the possibilities of using the voice input to teach drafting to the physically impaired.

Write No. 605 on Inquiry Card

Answer Keypads Replace Pencils At Florida School

In one classroom at the Roy Allen Elementary School in Melbourne, Fla., there are no papers, pencils or textbooks. In fact, in this classroom there are no tests to grade, not even any grades to record. An electronic classroom has changed the way teaching is done.

How does the electronic classroom operate? To begin instruction, the main points of a specfic subject are projected on a 50" video screen placed at the front of the classroom. The teacher explains the material and a question and answer session follows. The students answer questions by pushing buttons on calculator-like keypads. Within seconds, the computer records the students' answers and shows the class member responses in the form of a color bar graph. The lesson then continues. At the end of each lesson the system gives the teacher a printout of each student's answers and scores.

Adapted to Textbooks

The electronic classroom was an idea that Roy Allen Elementary School Principal Estle White conceived three years ago. He believed computerized group instruction could save the school time and money.

"We were looking for a system that not only proved to be economical but could be adapted specifically to our textbook material," White said. "The commercial software that we looked into proved to be very expensive, with one computer to one pupil, and decreased the teachers' flexibility in classroom instruction."

Reactive Systems, Inc. of Englewood, N.J., was able to provide the equipment to implement White's idea. The company's Group Response System stresses group, rather than individualized instruction. It is designed to facilitate traditional instruction, rather than replace the instructor with a computer.

"The movement of the words across the screen, the color bar charts and the participation of all students makes for a dynamic presentation," says White. "It certainly beats the old method of teaching on the chalkboard."

All Students Participate

Instead of one student answering a question while others listen, the system allows every student to participate in the group learning process, and to find out immediately how they've done compared to their peers. At the same time, teachers can track students' progress and pinpoint problem areas.

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Applications *(continued)*

"The system works well with both low and high achievers, since the programs can be adapted for rate of speed, levels of difficulty and amount and kind of directions given for lessons," says Gerri Henderson, a sixth grade teacher. Students do this extra work on individual computers and are thus able to keep pace with their classmates.

Teachers are generally enthusiastic about the electronic system, the principal reports. Instead of the teacher working for the computer, the computer works for the teacher, since the response pads allow for constant feedback on specific lessons that relate to the classroom textbook material. Also, tailor-made software can be shared with other schools in the local area.

Sixth graders at the Roy Allen Elementary School find their electronic classroom fun to use. Since they don't have to write all the time, the system allows for greater concentration without interruption. In addition, all students are given the chance to familiarize themselves with the computer.

"This is the wave of the future," notes White. "There are many benefits in using this system; teacher time can be spent more productively, since time is no longer spent on correcting and recording grades for tests."

Future interactive applications planned by the manufacturer include a system that will be able to adjust automatically to more challenging or easier lessons based on students' performance.

Write No. 601 on Inquiry Card

Question Databases Speed Up Creation Of Numerous Tests

by Pam Jones

Every instructor needs to monitor student progress, and many also want to provide students with self-evaluation tools. Evaluation usually means tests, and tests require time to prepare. Now that grading and grade record-keeping can be done quickly and simply on microcomputers, the generation of the tests themselves may be the most time-consuming task required of the educator outside the classroom.

However, a new trend in resource sharing may alleviate some of the time involved in writing and rewriting test questions. By collaborating to design and maintain large test item banks, instructors in the same subjects can share the work involved.

Health Sciences Take the Lead

In certain disciplines that require mastery of large quantities of factual material, such as medical and health sciences, test requirements are heavy. Educators in these test-intensive disciplines have therefore taken the lead in using big test item banks.

A good example is the New Jersey Medical School of the University of Medicine and Dentistry of New Jersey. The school conducts two biochemistry courses each year, one for about 100 dental students in the Fall, and one for approximately 200 medical students in the Spring.

"There are four exams and a final in each course," said Dr. Norbert Swislocki, professor and chairman of the biochemistry department. "So we'd be making up one multiple choice exam a month, on the average." With 50 to 60 questions on each exam and up to 100 questions on the final, quite a bit of instructors' time was spent on test generation.

Since 1980, Swislocki's department has taken advantage of the Medical Biochemistry Question Bank (MBQB), a database of 8,000 biochemistry questions published for the first time that year by the American Association of Medical Schools. It aided Swislocki and his colleagues by giving them an inventory of carefully evaluated questions to use in generating tests. But there remained two problems.

Until recently, software for managing the MBQB on computers was available only for mainframes. This meant the New Jersey Medical School, and many other biochemistry departments, purchased the question bank in hard copy. Instructors still faced the task of manually selecting from among 8,000 printed questions, then having them retyped.

The second problem was that some professors wished to combine questions they had written themselves with those selected from MBQB. This added to the chore of generating five unique tests for each course.

"It almost seemed as though one of the people in the office was always busy generating as exam," Swislocki recalled.

Microcomputers

For this reason, when software became available a year and a half ago for managing the MBQB—or any database of properly designed multiple-choice questions—on microcomputers running under CP/M, the New Jersey Medical School purchased the program, three IBM PCs and one IBM XT. They've been using using the microTIM programs (TIM stands for Test Item Management) by JL Educational and Computer Services for the past year.

"It has been a positive experience for the people responsible for generating the exams—myself and the course coordinator. It's become very systematic," Swislocki said.

Since the software was written to make the MBQB available on microcomputers, the developers of microTIM collaborated with Dr. Julian A. Peterson, editor-in-chief of the Medical Biochemistry Question Bank. However, the software publishers recognized that the system should also enable any

department, group, individual instructor or media center to design, construct, maintain and use their own test item banks, as small as 200 questions or as large as 20,000. It is this capability that has allowed New Jersey Medical School faculty to develop their own Faculty Question Bank, and to compose tests mixing their questions with those from the MBQB.

"Some faculty feel comfortable using MBQB questions. Others want to write their own," the department head explained.

Search Routines

Selecting questions to be included on a test still requires an instructor's time and attention, but Swislocki said the process is easier with microTIM's search capabilities.

"The database is searched according to the letters A through R, which are symbolic for major categories," he said, explaining how searches are done in the MBQB. "There are also subcategories that number into the hundreds.

"To select questions, you just search a particular database. Database M, for instance, might be membranes. You would search that database for questions on membranes. Then you could search within that database for questions about lipids in membranes. You could have a very narrow exam or a very broad exam, depending on how fine you want to cut."

Once the questions have been selected, it takes approximately 30 minutes to generate a test, he said. About half that time is actual printing time and the rest is required by the program to put the questions in a random order. Randomizing the questions is crucial to the medical school testing process because it virtually eliminates the possibility of cheating, according to Swislocki.

"It's very difficult to make up different questions on the same order of difficulty. What microTIM does is randomize the same questions, so you can have two or three versions of the same test, but with the questions in a different order." It does a student no good to copy the answer to question number 4 from the person sitting next to him, if it is not the same as his own question number 4.

"I don't know if we had that much cheating before, but we're responsible for seeing that there isn't any, and this is one way of doing that," he said. He feels this improves upon the school's previous method, which was to separate students by one or two chairs.

Although the test item management software has a student module for managing student interaction directly with the question database, the New Jersey Medical School still generates hard-copy tests for the dental and medical students who take the biochemistry course. To make those hard copies easier to produce, they rely heavily on the system's other two modules, one designed specifically for the instructor and the other intended for use by a person who may be designated the database manager.

Write No. 604 on Inquiry Card

Phone Tele-Teaching Brings Classes to Students at Home

Tele-teaching—teaching over the telephone—was first implemented in the Tucson Unified School District in September 1972. At that time, conference call operators were used to connect students and teachers. Only 12 people could participate on any one call.

Since early 1983, however, the district has been using the AT&T Information Systems Quorum Teleclass Bridge to teach as many as 20 students at one time who will be out of school for at least ten days.

While the number of students involved in the tele-teaching program at any one time varies, between 100 and 125 junior high and high school students generally participate during the school year. Classes begin at 7:45 a.m. and run until 3:25 p.m. Each class lasts 40 minutes, with a ten-minute break in between. Students hang up after each class and call back for their next one.

"Prior to the tele-teaching concept, teachers were required by state law to visit the homebound student for instruction for at least one hour per week," explained tele-teacher Betty Braucher. "Because there were so few available teachers and so many homebound students, teachers had very little time to spend with each student and were unable to cover a variety of

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Applications *(continued)*

subjects in any depth. With tele-teaching we offer a more normal range of courses."

In addition to improving education and increasing instruction time for homebound students, a major benefit of teleclasses is that they permit interaction between the students, giving them a classroom-like experience. This socialization is important for homebound and hospitalized youngsters who can easily feel bored and isolated, and who lack stimulation from their peers.

The Tucson district's homebound teaching program currently employs eight teachers, two of whom also make homebound visits to students in the sixth grade or lower and to mentally handicapped students.

"In a typical classroom setting, it's virtually impossible to give a student individual attention," Braucher said. "With the teleclass bridge, the teacher can use the "isolate" mode to focus attention on one student to make sure he or she understands a lesson without embarrassing the student in front of classmates. It also makes the students feel someone cares about them."

Another advantage of tele-teaching is that classes start promptly. Either the teacher calls the students to establish the teleclass or the students call into the system. The class is over the instant the student hangs up the phone.

"When the burden is on the students, we find they take responsibility for their lives," Braucher said. One evening, when a teacher who taught her tele-teaching class from home was delayed, the students made the scheduled conference call and began discussing the lesson themselves.

The Tucson Unified School District has three of AT&T's Teleclass Bridges in special studios and offers a wide range of courses including consumer math, pre-algebra, junior high school math and science, biology, earth and physical science, English, exploratory literature, creative writing, reading, remedial English skills, business English, business principles, free enterprise, Arizona government, American history, world cultures and social studies.

They also teach driver education, music appreciation, home economics and art. A spectator sports course enables homebound students to earn their necessary physical education credits. One teacher even used tele-teaching to take students on a field trip to the World Series. They conferenced as the game was about to start and discussed the game as it progressed.

"Tucson is a sprawling city," Braucher noted. "Because of the time it takes to drive across town and the heavy traffic, it's particularly hard to offer homebound instruction cost-effectively."

In the past, for example, homebound high school students were taught math and science by one instructor and social studies, home economics, art, history, English, and other languages by another teacher. Now individual instructors can teach their specialties over a telephone line.

"The bridge enables us to offer more courses," Braucher acknowledged, "but it also breaks the isolation of students who have been sidelined. Whether it's through an illness or an accident, this contact seems to help their recovery. They enjoy getting together with other young people and talking."

A sophomore, who Braucher referred to as a "star student," believes he's learning more through tele-teaching than if teachers made a weekly visit to his home.

Another student who had hemophilia was unable to attend school but was able to graduate because he could take classes whether he was at home or in the hospital.

Braucher noted that the quality of reception with teleclasses supports the quality of the teaching. The district plans to add electronic blackboards to its tele-teaching system to provide visual support for the audio teaching. Writing on the pressure sensitive board will be transmitted electronically to video monitors—probably a television set—in the student's home.

Write No. 606 on Inquiry Card

Projector Brings Interactive Video To Computer Classes

Without interactive video, things would be quite different at the University of Wisconsin's College of Electrical Engineering and Applied Science. For one thing, that department might find it difficult to satisfy the large number of students who sign up for computer classes.

"Our computer science courses involve learning on the kind of sophisticated computers the students will encounter in their careers," explained Professor Leonard Levine. "These courses have become extremely popular and we now have too many students to group them around the individual terminals."

Instead, classes as large as 180 students gather in the college auditorium, which is equipped with the V Star 4 video projection system from Inflight Services, Inc.

Levine, who has been using computer-projected graphics as a basic component for his course in electronic engineering and microcomputer technology for the past year, feels the equipment does more than simply solve the difficulties of huge classes. He says it changes the way he teaches.

"Interactive video may just be the best teaching method available today," he said. "It helps me present my computer science courses, for example, in a dynamic, interactive situation. It's a faster, more effective training and learning tool than linear instruction. It provides one-on-one instruction, instant feedback to student queries, and permits a continuing dialog between teacher and students." Use of the video projector has become crucial to this process, the professor said.

"I am not confined to any set presentation. The dialog between instructor and students is alive; the projected information has tremendous impact on the big screen—it is vividly, dramatically and immediately accessible to all."

The projector Levine uses is equipped with flat field CRT lenses that achieve high resolution corner-to-corner, enabling him to display more information than he could on a TV monitor. The high resolution also provides a clear image in lighting sufficient for note-taking.

"We are now thinking about extending its (the video projector's) applications—in presenting material from under microscopes and in projecting all manner of instructional type tapes," Levine concluded.

Write No. 603 on Inquiry Card

IBM has been in the 11th grade for 20 years.

When it comes to classroom use of the computer, 1st grade right through 12th, a single terminal or a whole school system, no one's making better grades than IBM.

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International Conference Examines Technology in Education

by Dr. DONALD J. SENESE
Assistant Secretary for Educational Research and Improvement
United States Department of Education, Washington, D.C.

Surveys, case studies and syntheses of findings exceeded 500 pages of documentation.

An international conference on the subject of education and the new information technologies was held in Paris, last July. It brought together almost 200 delegates, observers and experts from 24 member countries focusing on one of the most important issues facing educators today—the pervasive use of the new information technology, especially the computer, in Western society and its impact on the schools.

The conference sponsor was the Centre for Educational Research and Innovation, one of the committees of the Organization for Economic Cooperation and Development (OECD). OECD developed as an outgrowth of the Organization for European Economic Cooperation (OEEC), which served as the coordinating unit for United States' aid to rebuild war-torn and economically ravaged Europe through the Marshall Plan. Realizing the existence of areas of common interest and mutual concern, the United States and other European nations sought ways to continue this spirit of cooperation. This desire became formalized in 1960 when 20 nations signed the Convention of the Organization for Economic Cooperation and Development.

While the work of the United Nations and the North Atlantic Treaty Organization had higher visibility in the immediate post World-War II world, OECD began its task of promoting the economic growth of its member countries by expanding trade among the more and less developed countries (inside and outside its membership). Faced with greater unity and less political confrontation than the United Nations Educational, Social and Cultural Organization, OECD has produced a generally impressive record of documentation, communication and cooperative activity in the economic sphere, but not always without certain difficulties. The United States has been a principal partner in all of these activities.

OECD Educational Activities

Almost overlooked in the concentration on trade and other economic activities has been the activity of two OECD committees designed to assist member countries in areas of common concern in the field of education—the Education Committee and the Centre for Educational Research and Innovation (CERI). Common concerns have included the study of ways to promote links between education and working life, the analysis of policies involving equal educational opportunity, the examination of new options for youth and learning opportunities for adults, and a continuing comparative review of educational structure and planning issues that includes the collection and dissemination of statistics and other indicators of educational trends.

While the Education Committee has tended to concentrate on issues of continuing educational interest which draw mostly government education officials as representatives to meetings at its headquarters in Paris, CERI tends to examine new options in education, and generally draws to its meetings university researchers and other experts.

The dramatic impact of the new information technologies in the economic sector stimulated a new interest among CERI members leading to approval by

Dr. Donald J. Senese

the CERI Governing Board in 1981 of a major study of the potential impact of modern information technology on education. CERI project activities and meetings from 1982 through 1984 focused on the first phase of the study—the collection and analysis of data on country policies, practices and research relating to the introduction and use of the new information technologies, especially computers, in education.

The conclusion of this phase would come with the July 1984 conference in Paris, which would serve not only to gather together government officials and experts for discussion of the issues raised by the study activities, but as a forum for the development of recommendations on any follow-on activities.

As a CERI Governing Board member and somebody with a strong, personal interest in the impact of technology on society and education, I made available the full resources of the Office of Educational Research and Improvement on behalf of the U.S. Department of Education, including the services of Arthur Melmed, a recognized expert in the field, who served on the CERI planning bureau for this study headed by Pierre Duguet of the OECD secretariat.

The shortage of educational software was identified as a barrier.

The Conference

Much preparatory work was planned and completed by the time country delegates took their seats for the opening session. Surveys, case studies and syntheses of findings exceeded 500 pages of documentation. Delegates had available to them:

—a survey of trends and developments in member countries of the introduction and use of modern information technology in education;

—a survey of research and development on applications of cognitive and computer sciences to instruction;

—a projection of the nature and cost of hardware, software and courseware for multimedia educational environments for the remainder of the decade;

—an economic analysis of the cost of educational practice and organization using technology;

—some implications of classroom use of technology on teaching and teacher training;

—the potential impact of technology on curriculum and institutional structures;

—the cognitive demands and consequences of the new technology on learning processes in formal education; and

—a synthesis of the main issues, prepared by the OECD secretariat, based on all other completed work.

The secretariat's synthesis of the main issues may be summarized in the following way. First, the new technologies, rather than being thought of exclusively as a support tool for the teacher or as a new subject for the school curriculum, has the potential to change radically the structure and organization of education, and its productivity and delivery mechanisms. Second, the response of educational systems to this potential would to a considerable extent be influenced by factors outside of educational systems, as these technologies are having a pervasive impact on all of society and the economy. And finally, the adaptation of educational systems to this unanticipated technological revolution would determine its credibility and perhaps its legitimacy as a social institution.

CERI tends to examine new options in education.

The conference was called to order by J. Ronald Gass, OECD director of CERI. Representing the United States was a delegation of eight including Arthur Melmed, Frank Withrow and Paul Resta (then) of the U.S. Department of Education; Andrew Molnar, U.S. National Science Foundation; Richard Grefe, Corporation for Public Broadcasting; Judah Schwartz, Harvard Educational Technology Center; L. Linton Deck, Vanderbilt University; and myself, who served as chairman of the U.S. delegation.

The opening session featured an address by the president of the conference and an audio teleconference involving high government officials in Canada, the United Kingdom and at the conference site in Paris.

Bette Stephenson, Minister of Education and Minister of Colleges and Uni-

(continued on page 96)

Conference *(continued)*

versities, Ontario, Canada, served as president and opened the conference with a comprehensive statement of her views on the conference topic. Observing that the printing press centuries before had become the new educational technology of that age, she noted that the key to the present information age and the new educational technology was the microchip, and that "the form in which we can see its potential most clearly is the computer." She urged the use of computers to improve instruction, "allowing the student to use computers as personal learning tools, like textbooks, notebooks and libraries," and urged that computer literacy be thought of as a component part of literacy, the name we give to the means of communicating among ourselves.

In a practical demonstration of the potential of the new technologies to improve communication, the opening session of the conference included an audio teleconference that involved Alain Savary, the former French Minister of Education; David King, Minister of Education of Alberta, Canada in Edmunton; Kenneth Baker, U.K. Minister of State for Industry and Information in London; and other high government officials.

Additional plenary sessions, demonstrations of hardware and educational software and working group sessions that were the backbone of the conference occupied the remaining three days of the conference.

The opening session featured an audio teleconference involving high government officials.

Five Working Groups

Five working groups met for one and one-half days to draw conclusions from completed work and to prepare recommendations for follow-on activities for consideration by the OECD secretariat and the CERI Governing Board.

The first working group was concerned with issues including policies, strategies and implementation of the new information technologies in education. It found that despite much discussion of the potential of the new information technologies for changing the structure, organization and delivery mechanisms of education, little of substance in this connection had occurred in member countries of OECD; nor did government representatives of member countries present acknowledge the existence or development of such far reaching policies and programs.

Most member countries were concerned instead with implementing the use of computers in the schools at different budgetary levels and levels of sophistication. The conclusion lead to recommendations that OECD act to facilitate the exchange of information among member countries of costs, benefits, and unintended adverse effects.

The OECD also decided to study strategies for countering resistance to the introduction and use of the new technologies in schools; promote the exchange of information on available educational software and its effectiveness; and promote research and cooperative research efforts aimed at developing advanced paradigms that improve the effectiveness of instruction which uses the computer.

The second, third and fourth working groups were concerned with various impacts of the use of the new information technology on schools, such as changes in the curriculum, changes in the teaching function, teacher training and possible changes in the learning functions of students. These groups concurred in the finding that present knowledge of these matters was inadequate to the needs of policy-making, and that additional surveys, empirical research and case studies were necessary. This finding lead to recommendations that OECD act to facilitate the exchange of information on these matters among member countries, and conduct low-cost comparative case studies that would contribute to the total store of knowledge.

The fifth working group was concerned with various technical considerations of the production and exchange of software and courseware for a multimedia educational environment. Its principal recommendation was that OECD act to assist in the development and establishment of international standards for the exchange of courseware authoring systems analogous to the standards that exist for machine tools or for certain computer programming languages.

Summary and Conclusions

There is a great desire among member countries for information on the use of technology in the schools that works. The United States, Canada and the United Kingdom are the most advanced in their explorations and the OECD seems a suitable instrument for the collection and exchange of this information.

The shortage of educational computer software was identified as a barrier inhibiting the use of computers in the schools to improve instruction. There was widespread interest among country delegates about the means that could be implemented by OECD to improve knowledge of existing software products and of their educational use and effectiveness, and to reduce the legal and technical barriers that inhibit the transportability of software products across national boundaries.

I would be remiss, as chairman of the U.S. delegation, not to highlight the special position of the U.S. in the field of computers in education, or its role in support of this CERI project: Education and the New Information Technologies. The U.S. is a nation wealthy in human and financial resources. Our system of decentralized control of education allows for an exceptional richness of experimentation and innovation. It is not surprising then to find that we have more computers in the classroom than any other member country of OECD, and are well advanced in the establishment and use of on-line databases of educational computer software and in the use of electronic networks for sharing and exchanging educational information.

We have the further advantage of being able to draw for our explorations and instructional applications development on new knowledge from research in cognitive and computer sciences, academic disciplines in which we have a world class position.

I have already reported here my whole-hearted support for this OECD/CERI project, and hope that the OECD will examine various ways in which it can continue to play a "balance wheel" role, facilitating the exchange of information among nations and promoting other cooperative activities where feasible, that will help advance the improvement in education which we all seek. J

There is a great desire for information on the use of technology in the schools that works.

Educational Computing Programs of the Department of Defense Dependents Schools

by Dr. DENNIS L. BYBEE, Chief
Instructional Support Services Branch
Office of Dependents Schools, Department of Defense, Alexandria, Va.

The Department of Defense Dependents Schools (DoDDS) is a K-12 school system with 269 schools operated on military bases for approximately 144,000 dependents of U.S. government personnel stationed overseas. Early in 1981 it was decided that courses in computer literacy should be added to the curricula of the DoDDS. Implementation was scheduled to take place over a four-year period beginning with the 1982/83 school year. However, school and community interest in this program has been so intense that the entire activity is now fully operable . . . two years ahead of schedule.

The procedures followed in establishing the DoDDS computer literacy program may be of assistance to civilian school districts faced with the same need.

Educational computing encompasses the total perceived integrated uses of computers in DoDDS from Grades K through 12. To identify and delineate these activities, it was determined that student objectives should include both computer literacy and computer science, and that support functions would encompass computer education services as well as school administrative support (see Figure 1).

Student objectives in computer literacy and computer science were identified for Grades K-12 through a two-year process that involved students, parents, teachers, administrators, curriculum specialists, educational program directors and consultants. The process began with local committee efforts in identifying desirable learning outcomes called "program objectives," preparing an outline of activities to define each outcome in teachable terms called "instructional objectives" according to Bloom's taxonomy, and assessing the appropriate entry and proficiency grade levels as normal expectancies for student achievement. The product of local efforts was shared among several regional working committees; reviews were consolidated and reviewed again before publication.

Implementation of Student Objectives

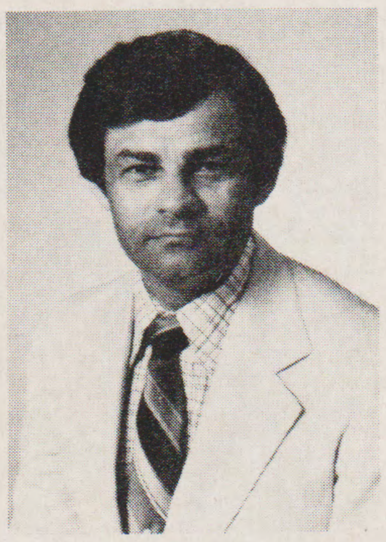
Studies of DoDDS equipment requirements to support the computer literacy and computer science objectives led to the development of equipment specifications and the number of workstations required to accomplish these objectives in a variety of school settings based on school size and type.

The basic workstation comprises a CPU with at least 48 Kbytes of RAM, two 5¼" diskette drives, a color CRT, standard typewriter-style keyboard, and an 80-column printer. Each system operates in two languages: BASIC and PILOT or LOGO for elementary schools; and BASIC and PASCAL for secondary schools.

Hardware needs were established for each school based upon its type and size. The size factor was grouped in intervals from 300 to more than 1,000 students, with incremental assignments of additional workstations at break points which the original requirement determination studies indicated were consistent with variations in planned school utilization of computer technology. The resulting distribution yielded an average assignment of one workstation per 100 students (see Figure 2).

Equipment installation was scheduled for secondary, middle/junior high schools, and elementary schools in that order. The order was based upon a

The entire operation is fully operable . . . two years ahead of schedule.



Dr. Dennis L. Bybee

need to replace outdated equipment in the secondary schools. However, community demand was such that all 1,374 systems were installed in just two years—twice as fast as planned.

Computer Education Workstation Requirements

School Configuration	Enrollment:	Workstations
High Schools/Secondary Schools/ Combined Schools (K-12)	≥ 1000	10
	≥ 750 < 1000	8
	≥ 450 < 750	6
	≥ 300 < 450	5
	< 300	4
Middle Schools/Junior High Schools/ Combined Schools (K-9/10)	≥ 1000	8
	≥ 500 < 1000	6
	≥ 300 < 500	4
	< 300	3
Elementary Schools	≥ 1000	8
	≥ 500 < 1000	6
	≥ 300 < 500	4
	< 300	2

In November 1981, DoDDS began a materials review process in which publishers of educational materials throughout the United States were asked to submit computer literacy and computer science learning materials (not software) which they felt were consistent with the DoDDS student objectives and which were hardware independent.

Materials were received and reviewed by regional computer education program development committees in the Winter of 1981/82, and completed the following Spring. A list of tentatively adopted materials was used in preparing material pilot programs that were conducted during the 1982/83 school year. While those pilots were in progress, and after DoDDS had chosen Atari 800 systems through a competitive bidding process, a second materials review was conducted of materials which were dependent on that specific microcomputer. Following successful field tests of the materials favorably reviewed, a list of acceptable materials was prepared, and school purchases of the authorized materials began during the 1983/84 school year.

Systematic Process Implemented

An ongoing systematic process for reviewing software was implemented in February 1983. As a member of the national clearinghouse for microcomputer courseware, sponsored by the National Institute for Education, DoDDs routinely

(continued on page 100)

Hardware needs were established for each school based on its type and size.

reviews courseware and then submits these reviews to the clearinghouse for distribution through member institutions. Additionally, DoDDS solicited machine-dependent materials directly from vendors, and in 1983 reviewed more than 500 of those programs. A software directory was prepared in January 1984 and distributed to DoDDS schools for their use in acquiring appropriate adopted courseware.

Two curriculum guides are in preparation for use in DoDDS. The computer literacy guide is in pilot use by K through 6 schools during the current school year. A draft computer science guide was prepared in 1982 and is now in use within each of the five DoDDS regional offices for use in Grades 7 through 12.

It is anticipated that the modular design of these guides will facilitate periodic updating as additional activities are developed. Both guides are criterion-referenced by grade to the student objectives in each discipline.

The DoDDS personnel network was specifically designed to support educational computing program development, and includes three key staff members.

At the DoDDS headquarters in Alexandria, Va., (essentially a state department of education) and in each of the regional offices overseas (equivalent to school district offices in the U.S.) there is an Educational Computing Program Coordinator. The purpose of this position is to provide overall coordination within the assigned area of responsibility. There also is a School Computer Coordinator. The responsibility of this school-level staff member is to coordinate school computer activities related to computer-based instruction, computer literacy and computer science for one or more schools within a specific geographic area. The third key member is the Computer Science Teacher, who works at the secondary level to implement those objectives identified within the computer science curriculum.

The DoDDS computer literacy program may be of assistance to civilian school districts.

Surveys Conducted

Needs assessment surveys conducted among elementary and secondary teachers by members of the mathematics curriculum development task force in 1978 showed that computer education was the highest inservice training need expressed by secondary teachers. Among elementary teachers it was second only to training in manipulative and tactile activities. Since that time, DoDDS has actively engaged in an ongoing program of inservice training for all staff members.

Training is provided for DoDDS educators in the overseas military community by educational computing coordinators, school computer coordinators, hardware vendors, consultants and by several universities. For example, during Summer 1983, more than 600 DoDDS educators participated in college courses in computer education offered on military bases in England, Panama, Japan, Korea, Okinawa, The Republic of the Philippines, Germany and Spain.

The focus of inservice training for DoDDS educators has been on the educational computing program goals and objectives, Atari 800 hardware/software, fundamentals of computer programming in the BASIC and PILOT languages, and essential characteristics of computer-based instruction. Future efforts will also include hardware maintenance and programming in the PASCAL language.

The product of local efforts was shared among several regional working committees.

In 1981, DoDDS began working with the Northwest Regional Educational Laboratory (NWREL) in Portland, Ore., in developing instructional objectives and objective-referenced multiple-choice tests at Grades 4, 7 and 11 in computer literacy, and at Grade 11 in computer science. To address 19 student objectives in computer literacy and 11 more in computer science, 478 test items were developed. For the Grade 4 level, two 40-item tests were developed. For the Grade 7 and 11 levels, twin 50-item tests were created.

Field testing was conducted among randomly-selected schools within each overseas region in the Spring of 1982. Based upon an analysis of item statistics, tests were then revised and administered to nearly 3,000 DoDDS students one year later. At the same time, identical tests were administered to a comparable sample of school districts in the United States. The results of the testing indicated that:

—overall knowledge of computer literacy concepts increased from 1982 to 1983 at all grade levels;

—student achievement on the tests was highly related to the amount of computer instruction and hands-on experience they received;

—there was a great deal of variability among DoDDS regions and schools within those regions in regard to the amount of computer experience students are receiving; and

—90 percent of DoDDS students at all grade levels tested expressed an interest in learning more about computers.

All of these findings are consistent with known program delivery statistics, and tend to confirm the high levels of reliability reported for the tests themselves.

On Nov. 4, 1983, NWREL announced its intention to publish and distribute these computer literacy and computer science testing materials. Information about those materials and the testing services can be obtained from the NWREL Office of Marketing, 300 S.W. Sixth Ave., Portland, Ore., 97204.

Professionals Get Involved

The process phase in which objectives were established was very successful. Involvement of a large number of diverse professionals appears to have been the key direction which resulted in an objectives document having a high degree of credibility among educators charged with implementing the program.

Hardware selection was a major activity, and while it resulted in the acquisition of excellent equipment, most educators now recognize that the number of workstations is insufficient since in most cases student demand far exceeds this program delivery limitation. DoDDS is now planning another acquisition effort to make an additional 3,000 to 5,000 microcomputer systems available for student use. This move will bring the student/workstation ratio down to approximately 30 to 1. The actual requirement is now under study, and decisions with respect to their use for computer-based instruction will probably be the controlling factor in determining an appropriate ratio. The acquisition is scheduled for October 1986.

Every day, new materials are becoming available to facilitate classroom instruction about computers. Early decisions by DoDDS to not become committed to a single listing of learning materials were appropriate and well justified by current events. The first "adopted listing" of learning materials published by DoDDS was distributed to schools with an addendum of more than 30 titles favorably reviewed during the time it took to publish the basic list.

Personnel Hired Early

Headquarters and regional office personnel were hired early in the development process. This was an essential aspect of the effort. The personnel network requirement for school computer coordinators was reviewed many times during the planning process, delayed several times during the Congressional budgeting process, and finally implemented with DoDDS assignment of one school computer coordinator for each geographically-dispersed management area. For the 1984/85 school year, 21 such coordinators have been authorized—approximately one for every 12 schools. Computer science teachers were assigned to schools as part of their pupil-teacher ratio. Student enrollment in secondary-level computer literacy/computer science classes has doubled in the last two years.

In spite of the fact that DoDDS has provided computer literacy training for more than 1,500 teachers during the last five years, staff demand for literacy training remains very high. Training demands have run the gamut from initial interest in computer orientation to demands for specific skills in utilizing the new delivery system in the classroom to teach curriculum content in such other academic areas as mathematics, science and social studies.

The evaluation effort conducted on this project has been especially successful. The assessment made throughout DoDDS and among a sampling of comparable school districts in the United States has yielded a wealth of information. The pre-test data will be very useful in the program evaluation efforts (including student achievement post-tests) now planned for the 1985/86 school year. This effort has resulted in assessment instruments that are now available for purchase from NWREL. J

A list of tentatively adopted materials was used in preparing material pilot programs.

DoDDS began working with the Northwest Regional Educational Laboratory in Portland, Ore.

The Introduction of Data Processing in Middle-Level Accountancy Training Programs in Developing Countries: A Case Study

by KARIN SCHRAMM
Management Development Branch
International Labour Office, Switzerland

This report is based on work done by the International Labour Office (ILO) between 1978 and 1984, and in particular on experience gained in implementing a technical assistance project at the Botswana Institute of Administration and Commerce.

It is guided by the conviction that most developing countries, having acquired computerized information systems, lack trained manpower to effectively utilize the technology. This report also takes the view that what is badly needed is computer-literate executives and well-trained computer system users as compared to computer operators at one end of the hierarchy and computer science specialists at the other.

Since 1972 when the United Nations[1] recognized for the first time that computer technology could play a significant role in development, various meetings were held and many authors discussed the issue, and urged member states to take computers more seriously in their development plans. Rarely have conditions which should govern the introduction of computer technology been given the necessary attention. And despite the wish that developing countries should not become dependent on the training offered by equipment suppliers, this is the prevailing situation in a great many countries with vendor training not going beyond a few days of operator training as part of the sales contract.

Over the last decade, office jobs have changed everywhere in various degrees. Therefore, business education curricula must also change to take these developments into account. This does not have to be stressed as far as the industrialized countries are concerned. But what about the developing countries? How much computer training is needed? What are the priorities? The purpose of this report is not to answer these quesions, but to illustrate the options, conditions, problems and solutions in one specific case, placing this case in a broader context.

Background on Botswana

Botswana, a landlocked country in Southern Africa, is about the size of France, but with only about 900,000 people. Its two main economic activities are mining and beef production. The main employer, the government, employs one-third of the working population.[2] Botswana belongs to the group of least developed countries.

The demand for administrative and professional staff is estimated to be growing at 10 percent per annum; the demand for clerical workers is growing at 8 percent. This translates into an annual demand for 120 bookkeepers and accounts clerks and for some 30 accountants. Since the education system could not provide the necessary trained manpower, a technical cooperation project[3] was started in 1978 to strengthen the then Botswana Training Centre and its two main streams: secretarial and accounting. Whereas some accountancy training has been organized by the university and the Institute of Development Management, as well as by the government's Accountants General's Office, this project concentrated on training people for positions as accounts

United Nations, Economic and Social Affairs, The Application of Computer Technology for Development *(ST/ECA/136), 1971.*

Most developing countries lack trained manpower to effectively utilize the technology.

2. Botswana National Development Plan, *Table A4, 1979-1985.*

3. *Project financed by the United Nations Development Program and executed by the International Labor Organization.*

clerks, assistant accountants and accountants.

Electronic data processing (EDP) was included in the program for three reasons. First, organizations and companies in both the public and private sectors were using computers for their accounting. Second, overseas professional bodies such as the Association of Certified Accountants, the Institute of Chartered Accountants and the Institute of Cost and Management Accountants introduced data processing in their examination syllabuses. Third, looking at the social dimension of training, it was felt that the accounts clerks and assistant accountants with EDP training would stand a better chance to keep their jobs despite rapid technological changes, to obtain promotions and to continue their studies at a professional level.

Nobody evisaged the rapid development and price reductions of microcomputers.

Data Processing Training

Data processing is introduced in the second year of training, which is the diploma level. It is not a major subject because the objective is not to train computer specialists, but computer-literate accountants who can read, understand and interpret electronically processed information, and make decisions based on existing computer technology.

Data processing occupies approximately 10 percent of the diploma course time and approximately 5 percent of the total two-year course. In all, 100 hours are spent on subjects including Introduction to Computers, Equipment, Fundamental Processes, Software, System Documentation, Future Trends and BASIC Language.

Certain decisions must be taken before the training program can start. Once the target population, the training needs and objectives have been determined and the training program is developed, a number of issues should receive due attention.

The recruitment, training and retention of a national data processing staff is actually the most difficult question to solve when setting up data processing training programs. There are several constraints in terms of salary, general working environment, practical experience, promotion and career prospect.

In Botswana, the problem is even more acute as there is a general shortage of educated manpower. Some 15 to 20 university graduates per year with bachelor of arts and bachelor of commerce degrees are quickly absorbed by government and private enterprises as well as training institutions.

Public sector salaries make it difficult to attract such staff to teaching positions and even more so to retrain them over longer periods. The result is that such teaching positions are held by expatriate staff for an indefinite time.

At the Botswana Institute of Administration and Commerce (BIAC) the data processing expert's duties included the training of one or more counterparts with a view to their taking over after the expert's departure. It was decided to recruit university graduates to train them from scratch in data processing as well as training methods. The first candidate left the project after one year for personal reasons. She had a B. Comm degree from the university, but preferred a career in accounting. It was decided then to recruit somebody with a slightly lower academic background, but job experience and a BIAC diploma in accounting and business studies.

It was decided that the counterpart, after some special sessions organized by the expert, would sit in as an observer for about one year, understudying the expert. In the second year he would start teaching with the expert sitting in, guiding him on both subject and methodology issues.

Data processing occupies approximately 10 percent of the diploma course time.

The counterpart is also sent on more specialized courses in programming and systems design in order to deepen his or her own knowledge of the subject matter. This further training takes place outside the country to give the trainer a different type of experience. It may, however, take place within the region which will allow him to meet with people with similar problems and to exchange views on how to overcome them.

Part-time lecturers—data processing specialists from the private or public sectors—would appear to be a solution; however, in the case of Botswana, this alternative was excluded for two reasons. First, the few specialists were needed full time in their jobs, and moreover, there are a number of problems with

(continued on page 104)

attendance, preparation and teaching approaches with this category of teaching staff.

Although the solution adopted by BIAC is not ideal, it is nevertheless considered satisfactory in the present circumstances. To avoid problems in the future, it would be wise to consider updating a greater number of teaching staff in new technologies and especially in data processing.

Hardware and Software

One tries to choose the right hardware for a specific project. However, rapid technological advances make comparisons and generalizations difficult. In Botswana, for example, when the project started, nobody envisaged the rapid development and price reductions of microcomputers.

By 1978, the main computer user was the government.

In 1978, the main computer user was the government which had a centralized computer facility, virtually the only one enjoying an after-sales service. The choice was obvious.

A terminal, VDT and printer were installed and linked to the government mainframe computer on a time-sharing basis through a telephone line. This had several advantages including full cooperation from the government Computer Bureau; full engineering and advisory services from the computer agency in the country; and reduced costs because supplies could be purchased at reduced rates, and there was no charge for government computer time.

The institute does not use any ready-made software packages applicable to various business problems, as the aim is an introduction to informatics and to programming. The question of ready-made software will, however, become acute as soon as computerized accounting is introduced at the higher diploma area.

Now, use is made of punch cards, paper tape, magnetic tape, disk pack and floppy disk for demonstration and learning purposes. Some 40 simple BASIC programs have been developed by the international expert and his counterpart and are available for the computer.

Other training materials have been created specifically for the project and include lecture notes, transparencies, handouts, assignments and exercises. The lecture notes are considered as guidelines for the teacher, whereas the assignments are intended as homework for the trainees. The training materials are of a general nature, whereas the supplies and demonstration materials which are provided either by the government departments or ICL are task oriented. This allows students to be conversant with supplies which they will find in their offices because 85 percent of all computing in Botswana is done on ICL equipment.

The selection of a computer language is usually governed by its application purpose. In a training situation, the level of training and scope of specialization are the main criteria. Therefore, when training accounting staff, the choice appears to be between COBOL and BASIC. Whereas COBOL requires technical skills, BASIC appears easier to learn taking into account the entry level of the trainees and the duration of data processing training.

Evaluation and Conclusions

Since the beginning of the program, some 300 students have been trained in accounting.

Since the beginning of the program, some 300 students have been trained in accounting, approximately 55 percent at certificate level and 45 percent at diploma level. The drop-out rate was 74 percent (until June 1983).

The positive conclusions which can be drawn from this experience are, first of all, that an atmosphere of computer awareness has been created. So far, the computer society and the users' group composed mainly of expatriate and a few local specialists did not have any impact on the local population.

The gap between the low-level, limited operator training and the attempt to train computer specialists to gradually replace the expatriate staff is gradually being filled. This new type of training has not only received national recognition in terms of recruitment and promotion, but also international recognition by overseas professional bodies. J

Development in the Application of New Technology to the Delivery of Open Learning

by MICHAEL R. FRESHWATER, Deputy Director
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Moorfoot, Sheffield, Great Britain

In December 1981, the British government announced plans for a New Training Initiative.[1] This document set out three major national objectives for the future of industrial training:

—to develop skill training in such a way as to enable students of various ages and education to acquire set standards of skills appropriate to the jobs available, and to provide them with a basis for progress through further learning;

—to advance to where all students, 18 and under, have the opportunity of either continuing in full-time education, or entering a period of planned vocational training; and

—to increase opportunities for adults, whether employed or returning to work, to acquire, increase or update their skills and knowledge.

Within this framework, the government proposed the development of an Open Tech Program (OTP) to make technical training more accessible to those who have the necessary ability. The program was launched in August 1982 by the Manpower Services Commission (MSC).[2] Open Tech was established as a major part of the MSC's strategy for meeting the third objective of the New Training Initiative. We were asked to concentrate its effort at technician and supervisory levels skills. We were given the tasks of opening and widening access to existing education and training provisions, and to make possible new education and training provisions for needs which could best be met through open learning.

Open Learning

Open Learning is defined as learning which enables students to learn at a time, place and/or pace which satisfies their circumstances or requirements. This open learning must reduce and remove barriers to access to education and training, and enable adults to progress by offering a choice of content and method of study.

The response to the OTP to date has been enthusiastic. As a result, the program funding has been doubled. By 1987 it has been planned that 100 major projects would have been started. By then, we will have provided a significant range of updating and initial training for a substantial coverage of our industrial sectors, and involved the contributors to the British vocational and education scene.

Currently, some 70 major projects are under way. It is estimated that during the 1985-86 financial year, some 50,000 people will have benefitted from training supported by Open Tech. The increased resources made available have not only enabled the program to grow, but have enabled us to directly encourage and commission work in areas where we see need for development. The program is now directed in the area of supervisory and management development; new methods of delivery of education and training; support for technical innovations; and a network of practical training facilities, where open learners can get practical experience in their subjects.

Learning Structures

We have found that people in industry do not want to study for a full-time course of, say, 200 hours, or even 60 to 30 hours for shortened courses. They

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1. *Department of Employment,* A New Training Initiative: A Programme for Action, *HMSO, London, 1981.*

We do not want the price of the materials to be a major barrier to learning.

2. *The Manpower Services Commission (MSC) was set up on Jan. 1, 1974 under the Employment and Training Act of 1973 to run the public employment and training services.*

Open learning packages enable a wider range of people to learn.

People in industry do not want to study for a full-time course.

have encouraged our learning designers to produce learning programs which are modular in structure, and which can be broken down into self-contained learning elements of typically two to three hours, each of which can stand alone and be used to form an individual learning program.

The availability of low-priced microcomputers and minicomputers and associated, easy-to-use software, has been a major contribution to flexibility. Project managers are developing computer-based systems to record enrollments, registration information, fees and cost information; monitor and store information on achievements; as well as control the issue and sequencing of selected learning programs.

Access and Delivery

We have found that traditional methods cannot cope in situations where there is an urgent need to update large numbers of people, where major product changes require new knowledge and skills, or where there is an urgent need to disseminate new technology.

That is not to say that classroom or group methods cannot train to the level required, but that the method is limited by classroom space, availability, number of lecturers and the time needed to develop the trainer/practitioner skills. How can a company update 2,000 people by these methods in six months? Far better to get a specialist team together to develop a computer-based training (CBT) or alternative open learning package. Once such a package is available, the skills and knowledge can be made available to all who must know, as well as those who should and could know.

It has become clear the CBT can be operated as a "closed system," thus inhibiting the exchange and wide dissemination of material. This occurs when a learning program is written in a particular authoring language for use with specific hardware. We are encouraging our project managers to write programs that include conversion instructions for modification to other systems, thereby allowing their wider use. A major challenge is to convince suppliers, particulary of hardware, that compatibility and interchange offer benefits in increasing and broadening markets which outweigh any loss in commercial advantage.

The expansion of the OTP in 1983 and 1984 included the development of education technology and the use of new technology in training. A small team now exists within the Open Tech Unit dedicated to the examination of training methods, educational technology and new technology in training in particular. The new technology of learning is widely used in our program. We have set up a support project, Open Tech Training and Support Unit (OTTSU), to disseminate the best of current practice. This service is based on the Council for Education technology and, in consultation with each of our projects, OTTSU consultants design specifically tailored training to meet their needs and objectives. OTTSU also keeps for us a register of consultants, all of whom can contribute to ensuring a quality program.

The new technology of learning is widely used in our program.

The Way Forward

The trends in flexible learning described in this paper are at an early stage of development. The OTP and each of its operational projects have yet to be evaluated. Important issues have to be resolved on how to coordinate a national pattern of open learning provisions, involving exchange of material, delivered through a range of potential methods and collaborative arrangements; on how to ensure the quality of the program in both product and process terms; of how to develop generic materials in a way that they can be contextualized to fill specific needs, as well as how to adapt and deliver other people's materials; etc.

What the OTP aims to do is to make open learning an established part of the education and training plan, but one which brings the flexibility needed in the late 20th century. Information technology and computers are major tools in our strategy for opening up the system. J

Computer Education in the Vocational Teacher Training Centre at Eindhoven

by J.W.M.A. HOUBEN and J.A. VERBUNT
Vocational Teacher Training Centre
Eindhoven, The Netherlands

During the last ten years, the teachers in the higher technical colleges and senior technical schools first started to realize the far-reaching developments in information technology within The Netherlands' industrial sector. During the 1970s, information technology was introduced in higher technical education as part of the curriculum in order to meet those changes—the computer came into the colleges. Meanwhile, a teaching qualification for teachers of the higher vocational colleges came into being called "informatica."

Teachers from the country's 29 higher technical colleges in need of the informatica qualification were able to obtain it by inservice training, organized and offered by the universities.

While curriculum development for teacher training was in full-swing, an initial, promising attempt was made in 1981 to start a ten-day inservice course for mathematics teachers in the secondary and lower vocational education schools as an introduction to programming.

The inservice plan was initiated at the beginning of the 1981/82 term, so there was not much time for careful deliberation or planning. The courses consisted of a five-day course in computer applications in several technical disciplines. These computer applications were given in close relation with the computer curricula at the senior high technical schools. More than 600 teachers attended these courses taught at the Eindhoven University of Technology. Over the last three years more than 2,000 teachers took one of the refresher courses.

Three Types of Courses

There are three types of courses: pure informatics, applied informatics and applied technical informatics.

Pure informatics courses are designed especially for teachers in mathematics and physics. The teacher gets to know the basics of the data processing machines; learns BASIC programming; gets acquainted with PASCAL; and learns to apply these proficiencies in areas of professional skill in vocational education.

Applied informatics courses are developed especially for teachers in technical disciplines. The educational use of packages available from industry are demonstrated. During advanced courses, such packages are adapted to the needs of the teachers in senior technical schools. Problems tackled include construction engineering, mechanical engineering and electrical engineering.

Applied technical informatics courses are developed for teachers in the field of informatics. A distinction has been made between courses for teachers who actually teach the production of programmable equipment using microcomputers, and courses for teachers who use this equipment in technical disciplines.

Measures Taken by Ministry of Education

The Minister of Education and Sciences published a policy describing information technology activities to be developed in The Netherlands through 1989.

Some pilot projects were announced in January 1984 as a stimulus to step up the introduction of information technology in education. A so-called "cluster

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Pure informatics courses are designed for teachers in mathematics and physics.

More than 600 teachers attended these courses taught at the Eindhoven University of Technology.

The Netherlands *(continued)*

A so-called 'Cluster of Measures' was funded.

of measures" was funded. The funding was provided by the Ministry of Education as well as by the Ministry of Economics.

That funding was as follows:

—Setting up a national and partly regional infrastructure for developing and distributing programs, $13,500,000.

—Educational sectoral policy (refresher courses for teachers not included), $54,500,000.

—Elementary and special education, $5,000,000.

—Secondary education (age 12 to 16 years), $8,350,000.

—Secondary general education (age 16 to 20 years), $3,400,000.

—Vocational education and senior vocational education (including apprenticeships), $25,000,000.

—Higher vocational education, $14,170,00.

—Agricultural education, $1,650,000.

—Refresher course, guidance and information, transition training and furthering expertise, $10,000,000.

BUDGET FOR THE CLUSTERS OF MEASURES (in millions of dollars)

	1984	1985	1986	1987	1988	TOTAL
Ministry of Education (Official Memorial: "Education and Information Technology")	2	2	2	2	2	10
Ministry of Education, extra as part of the Priority List "Information Technology"	5	10	10	12.5	15	52.5
Ministry of Economics	5	5	5	5	5	25
Ministry of Agriculture	1.65	1.65	1.65	1.65	1.65	8.25
TOTAL	13.65	18.65	18.65	21.15	23.65	95.75

Consequences and Recent Developments

A national Centre for Education and Information Technology (COI) was founded, as well as a Foundation for Computer Management in Higher Vocational Education (SCB-HBO).

Whenever institutes develop operational plans, COI is primarily responsible for the choice of software. The SCB-HBO is primarily responsible for the choice of hardware.

Schools no longer own their own equipment. SCB-HBO distributes the hardware to the institutes and oversees its use. In cooperation between COI and initial teacher training centers, regional institutes have been set up in order to acquaint the teacher with the computer in the widest sense. These regional institutes are called Regional Institute for Computers in Education (RICO). We intend to have about 15 of these centers in The Netherlands. The 15 centers and the COI will be connected in an educational network. The task of a RICO will be to inform, advise, demonstrate, initiate, stimulate and coordinate information technology. Other tasks will be to apply for regional projects, organize refresher courses, develop programs of software and hardware, and maintain both national and international contacts.

Applied informatics courses are developed especially for teachers in technical disciplines.

Conclusions

It now seems possible in The Netherlands to develop a suitable curriculum for information technology in vocational education after a late, slow start. In order to reach an adequate level of new technology in the curricula, now and in the future, an Institute for the Development of Education is necessary. Cooperation between the countries surrounding The Netherlands is essential in order to benefit from mutual experiences. J

Teaching Computer Science at Secondary School: A Survey of Research and Evaluation in the Federal Republic of Germany

by Dr. ULRICH BOSLER
Institute for Science Education (IPN)
Federal Republic of Germany

The educational system in the Federal Republic of Germany is primarily still characterized by its three branches "Hauptschule," "Realschule" and "Gymnasium," with comprehensive reforms applied up to now to upper secondary education at the Gymnasium. There, a system of courses has been introduced which provides for various optional subjects. Experiments involving Gesamtschulen (comprehensive schools) are only very moderately supported, and the reform of the vocational school system is still forthcoming.

A federally structured school system might facilitate a variety of different experiments. This possibility is only partly made use of.

Reforms are sometimes hampered by the federal system with its inherent problems of responsibility at various levels. The federal government has only indirect influence, through such activities as research grants for example. The autonomy of individual schools is markedly restricted by way of guidelines issued by the respective school district, and is so far not comparable with that of American or English schools. Only upper secondary education has enough flexibility to introduce new subjects.

The traditional subjects offered within the German school system are not very flexible. It seems easier today to introduce an entirely new subject, such as computer science, into the secondary school rather than to integrate vital electronic data processing (EDP) components into other subjects.

Our national program of using computers in education, which ended in 1975, brought up the following key points:

1. A market for a national EDP industry needs to be created.
2. Only research was financed by the Federal Ministry of Technology, not the dissemination into schools.
3. Computers in education were introduced from the top via computer-assisted instruction (CAI) and administration. Plans in 1971 provided for two-thirds CAI and one-third administration; informatics at school was not systematically supported.
4. The CAI efforts stagnated and informatics was not sufficiently developed.

Expectations with regard to CAI had been much too high with the result that supporters were greatly disappointed when the expected success failed to come. CAI using large computers was too expensive, and the dissemination into the schools was missing. Now that the program has come to an end there are no longer any federally promoted CAI programs worth mentioning.

Computer science pilot experiments funded by the federal government are many. For example, the objective of one pilot experiment had been the development of teaching materials for a three-year course of computer science at upper-secondary education in Schleswig-Holstein. This material was prepared at one school and tested in four others.

Important results of the pilot experiment even went beyond the original objectives: hardware was procured; there was close cooperation among the teachers themselves as well as among teachers and persons acting as scientific advisers. Intensive training of the participating teachers resulted from the preparation of their own teaching materials. Infrastructure was developed in one region of the Federal Republic of Germany.

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A system of courses has been introduced which provides for various optional subjects.

Germany *(continued)*

Additional examples are the development of a curriculum for computer science in Rhineland-Palatinate, and the development of teaching materials in North Rhine-Westphalia for Grades 9 and 10 in Berlin.

In the past, pilot experiments have been the most important, but also the most expensive instrument for the institutionalization and recognition of computer science teaching. Due to financial constraints and greater reference of the districts to their educational autonomy there will hardly be any more pilot experiments in the coming years. However, with the increasing availability of microcomputers, the use of computers supported by individual communities is rising. The number of these projects is difficult to estimate and the quality of efforts varies greatly. According to a rough estimate about 30 to 40 percent of schools in general education are equipped with computers of some kind or have access to a large computer.

The traditional subjects offered within the German school system are not very flexible.

Curricula Contents

As early as 1969, initiatives were started in Bavaria to integrate computer science elements into general schools. Since then, computer science is taught in all districts including Berlin as part of mathematics education and as a subject of its own at the upper level of Gymnasium (upper-secondary education). Most districts have introduced computer science as an optional course in its own right which often emphasizes applications related to other subjects such as mathematics, physics and biology.

In lower secondary education computer science is usually offered in connection with other subjects like pre-vocational training in technology. In Berlin computer science can, on request, be taught mainly as a subject of its own at comprehensive schools within the range of optional courses.

A course system has been introduced providing for the choice of various subject of its own at the upper level of Gymnasium (upper-secondary education). Most districts have introduced computer science as an optional course in

Since computer science is a newly emerging field, curricula in the different school districts varies a lot as regards the topics, their sequence and the time allotted. From the point of view of content, the available curricula and draft curricula can be assigned mainly to three approaches to curriculum.

The hardware-oriented approach is based on the hardware development of the 1950s and 1960s and has influenced particularly the first curricula for computer science. Here it is considered to be mainly a technical discipline; conveying the mathematical/technical foundations of data processing is the main objective.

Within a short space of time computer science went beyond the more technical dimension and developed into a structural science. With the algorithm-oriented approach there resulted a fundamental change of the objectives and contents of education in computer science. The systematic search for algorithmic solutions to problems, and the formulation of algorithmic solutions to problems as programs, were to be learned.

CAI using large computers was too expensive, and the dissemination into the schools was missing.

The application-oriented approach derives from the development of curriculum reform, whereby it was declared that the traditional concept of teaching structured around separate subjects was no longer compatible with the educating and training function of the general school.

Learning the method of problem solving in the course of computer science education must take place within the context of the application of data processing in administration, industry and research, that is, within the context of the applications which appeal to the students.

The older hardware-oriented syllabuses have often been supplemented with respect to their content via the addition of algorithm- or application-oriented approaches.

Application-oriented components can be found in more recent curricula of the school districs of Berlin, North Rhine-Westphalia (pilot experiment at Gelsenkirchen) and Schleswig-Holstein (pilot experiment).

The curricula allots 60 or 120 hours, often 160 to 200 hours to computer science in some of the districts.

Vocational Education

The vocational sector is highly diversified as regards types of schools and specializations offered.

There are two types of educational provision: full-time vocational schools under the exclusive educational responsibility of the Ministers of Education, and the dual (part-time) system where the responsibility of Ministries of Education is limited to the vocational aspect.

EDP-related topics are found particularly at business schools. The treatment and introduction of EDP topics in instruction at such schools is partly analogous to the developments in computer science at general schools. The revision of the curricula with regard to algorithm- or application-oriented approaches, however, lags considerably behind general education.
education.

Business, in cooperation with the vocational school, is responsible for passing on abilities and knowledge defined in the regulations for vocational training. Besides a dualism of learning places ("school" and "business"), this implies dual training responsibility.

In order to coordinate these two sectors the Conference of Ministers of Education is preparing a nationwide framework curriculum. This is difficult and takes time. Since such a syllabus often does not provide enough flexibility, outdated knowledge is often declared as being relevant for instruction later on.

In contrast to general schools, a hardware-oriented approach is more often the case than an application-oriented one. This is particularly due to the difficulties and the time involved in developing framework curricula.

EDP-related topics are found particulary at business schools.

Programming and Teacher Training

A lively discussion has been going on about an appropriate teaching and learning language, underscoring the fact that the language strongly influences the type of problem selected and its method of solution.

The choice of the language strongly depends on the time available. If you have less time, an extended—often commercially-oriented—BASIC is useful. If you have more time, languages like ELAN, LOGO and PASCAL are helpful. PASCAL is spreading in the Federal Republic of Germany. Denmark has had good experience with COMAL. In the Federal Republic of Germany there has been too little experience with it.

Gradually teaching material has been made available through pilot experiments and a few books suited for schools were prepared. Teacher training is unsatisfactory. The classical forms of inservice training do not help since inservice training presupposes relevant basic education which is lacking. So far some teacher training is offered at university level. There are possibilities for future teachers in Berlin and at the Open University of Hagen. The best training has resulted from the pilot experiments mentioned above.

Often, only 30 hours are foreseen for data processing at vocational school.

Advanced training for teachers exists in the school districts on a limited scale. Individual and partly combined courses are usually offered. In some districts (i.e. Berlin, Lower Saxony and Rhineland-Palatinate) a complete schedule of courses was established.

The journal BUS is geared mainly to Bavaria. The editor is the Centre for Programmed Instruction and Computers in Education; it is published by the Bavarian Textbook Publishing Co. These journals can contribute greatly toward establishing computer science education in the Federal Republic of Germany by way of educational contributions and samples of instruction.

The importance of microelectronics will probably change the priority given to computer science education at school with respect to the increased recognition of computer sciences as a subject of its own, and as an instruction principle in different subjects. Computer science education could acquire a similar significance to that of mathematics instruction either as a subject of its own or as a complementary subject to other subjects.

If the effects of microelectronics are to be taken seriously, it is necessary to offer elements of computer science at lower-secondary education. J

Three Projects: A Report from Israel

by SAMUEL W. SPERO, Professor of Mathematics
Cuyahoga Community College, Cleveland, Ohio

Recently, my wife and I spent several weeks in Israel. During our stay in the country I met with some of the groups I had worked with during a sabbatical in 1974.[1] I learned of several interesting projects presently under way in Israel which use computers in an educational framework. What follows is a description of what I learned.

TOAM: An Arithmetic Application

TOAM is a Hebrew acronym for "Drill and Practice with the Help of the Computer." As its name implies it is a drill-and-practice package. Its most popular and best tested application has been in the area of elementary school arithmetic. The package was developed by the Centre for Educational Technology, a non-profit agency located on the campus of Tel Aviv University. Development of the package was motivated by a very real and well articulated need—the low scores on arithmetic achievement tests by students who would otherwise be classed as disadvantaged.

After extensive research, the model chosen for the design of TOAM was the Suppes' model. In this model the arithmetic curriculum is divided into some 14 strands. The strands are divided into difficulty levels. Students are assigned strands and difficulty levels within strands based on a pre-test. Movement within strands is controlled by a unique algorithm developed for TOAM which takes into account both the proficiency level achieved by the student on the exercises presented and the number of times the student was presented with exercises of the same type. TOAM assumes that students will have a maximum of 40 minutes per week at the terminals.

TOAM has been extensively tested with disadvantaged children in the elementary schools in Israel and has demonstrated time and again its capability of improving achievement in elementary school arithmetic. To date, more than 4,000 students have been through the TOAM system at several different testing sites. The use of this package has been effective in helping the students who were behind their advantaged peers maintain standard achievement levels.[2]

There are two versions of TOAM available. TOAM I uses a Digital Equipment Corp. minicomputer capable of driving 16 terminals. This system runs the arithmetic drill-and-practice program using floppy disks for mass storage and a specially designed dumb terminal with a modified keyboard. TOAM II, the newer system, has been designed for computer-assisted instruction in other subject areas, as well as for instruction in computer languages. TOAM II uses hard disks and includes terminals with a full keyboard. TOAM is available for export.[3]

MENTOR: An Author Language

MENTOR—that may not be its name when it is finally avilable for distribution—is an author language that has been developed for the Atari personal computer. The uniqueness of this package is that it permits the author of the course materials to take advantage of the very powerful Atari graphics capability.

Computer-assisted instruction implies that the student will first be presented with a body of information. This body of information is studied and then the student is evaluated. All CAI packages include the capability of developing screens for presentation to students; the capability of presenting these screens

1. *Spero, S.* Instructional Computer Systems in Israel: A Learning Experience and a Teaching Experience, *Journal of Educational Technology Systems, 1977-1978, 6, (1) pp. 33-44.*

TOAM has been tested with disadvantaged children in the elementary schools.

2. *Osin, L.* Computer-Assisted Instruction in Arithmetic in Israeli Disadvantaged Elementary Schools, *Computers in Education, New York, NY: North Holland Publishing Co., 1981, pp. 469-475.*
3. *For additional information contact: Yitzchak Inbari, Centre for Educational Technology, 16 Klausner, Ramat Aviv, Israel 69011.*

MENTOR makes it easy for the teacher to develop effective materials.

to students in the order specified by the author; and the capability of retaining statistics on the performance of the student.

What makes CAI work, when it does, is the effectiveness of the learning screens. Being able to present the information to be studied using graphics, color and sound, as well as text, will motivate the student to learn. The Atari graphics capability has been well noted in the literature.[4] It has no match in systems at its price and even in systems at many times its cost. Until the advent of MENTOR, however, being able to access the display list, the scrolling capability, and the character definition algorithms required a level of sophistication most teachers do not have. MENTOR makes it easy for the classroom teacher to develop very effective materials, conveniently.

MENTOR is based around an Atari 800 system which uses both a single floppy disk drive and a Corvus hard disk. The Corvus permits the user to connect up to 64 Atari 800s (without mass storage devices) to the system.

MENTOR has been developed by Edunet, a company established to design and market software for the education market and courseware developed under MENTOR. The company is funded by the prestigious Israel Corp. The package is presently in its final development stages.[5]

The Goldberg Variation

What would the Land of the Bible be without instructional computing applications in religion?

Gesher Educational Affiliates, a division of the Gesher organization—a non-profit religious outreach group—has been developing computer games with a religious flavor. Under the direction of Ya'acov Kirschen, a well known Israeli cartoonist and former computer consultant, GEA has begun the development of video and computer games with religious content to be used in the home. Their initial set of games, Nosh Kosh—a version of PacMan, Aleph Baiters—a version of Space Invaders, and Borders—a version of Donkey Kong, while cute, are really imitations of the arcade originals. Their most recent effort is more of an advance on Dungeons and Dragons than it is an arcade game.

GEA is developing a historically accurate, role-playing simulation which Kirschen calls the Goldberg Variation. At the outset of the game the student is able to select the role he will play and the characteristics of that role. This is similar to Dungeons and Dragons. Rather than the role of a wizard or warlock, elf or thief, the role to be played is the role of a member of one of several Jewish communities that actually existed during the 19th century. The player gets to select not only the place but also his or her occupation. In this role the player is presented with crises (as in Dungeons and Dragons) appropriate to the time, place, and occupation selected by the player. The game is won or lost based on how the player reacts to the historical crisis.

The game is being funded by the Joint Fund for Jewish Education under a special grant, and when it has been fully developed it will be available for several of the popular home computers at a competitive price.

While I have seen several of the historical simulations that are available here in the States, I am not aware of any that approach the historical experience in quite this way and with this attention to detail.[6]

Each of the three projects described has included some interesting facet.

TOAM is a return to minicomputer-driven, multi-terminal systems. Sophisticated drill-and-practice packages require the power of a minicomputer. TOAM also incorporates the more complicated algorithms for problem selection that have been bypassed in our hurry to market inexpensive systems.

MENTOR is a CAI author language running on an inexpensive personal computer, albeit enhanced with a Corvus hard disk to facilitate operation in a multi-terminal environment. Its great strength is that it permits teachers to take advantage of the full flexibility of the Atari's graphics and sound capability.

The Goldberg Variation from Gesher is a very interesting approach to computer simulations. Using a variation on the concept of Dungeons and Dragons, the Goldberg Variation permits the student to experience and participate in history rather than just read about it or discuss it. It lends a new dimension to the meaning of computer-assisted instruction. J

4. *Nelson, T.* The Atari Machine, *in The Creative Atari, Morris Plains, NJ: Creative Computing Press, 1983, pg. 9.*

To date, more than 4,000 students have been through the TOAM system.

5. *For additional information contact: Dr. Benjamin Chen, Executive Director, Edunet, Ltd., Madkit St., Herzliya-Pituach Industrial Area, Herzliya, Israel 46733.*

MENTOR is based around an Atari 800 system.

6. *For additional information contact: Dr. David Gefen, Director of Information, Gesher Educational Affiliates, 1328 Broadway, New York, NY 10001.*

The IFIP Teacher Training Conference

by DENNIS J. HARKINS
Wissahickon School District
Ambler, Pa.

Small discussion groups debated questions proposed by Tinsley's address.

The 'Micros in Schools' project produced a highly successful awareness pack for teachers.

The International Federation of Information Processors (IFIP) Working Conference on Informatics and Teacher Training met in Birmingham, England last July.

Invited participants from IFIP member countries presented papers outlining teacher training programs in their respective countries, and met in discussion groups to debate questions concerning the direction of computers in education.

The conference organizers had assembled speakers from around the world to provide a true international perspective for the future of informatics. The conference proceeding, to be published by North Holland Press, Amsterdam, should be a valuable document for anyone interested in a world view of technology in schools as well as an aid to those involved in creating teacher training programs in information technology.

In his keynote address, David Tinsley, conference chairman, outlined the influence of Working Group 3.1 in previous years, and reviewed the activities of three previous working conferences, the last one held in Malenta, Germany in 1983 on "Informatics in Elementary Education."

The theme of teacher training was chosen for this conference because, as Tinsley said, "We regard teacher education as the fundamental issue in the development of informatics at both the primary and secondary level and we believe that we must continue regularly to review our theories and practice in this important field."

Two questions posed in his keynote address provided good seeds for discussion: "How do we give teachers the time they need to become familiar with information processing?" and "Who teaches the teachers of teachers?"

Tinsley also noted the difficulty presented by the evidence that students often know more than their teachers about advances in new technology, and reflected on the prospect that teachers could become conductors of learning rather than lecturers to a class, although this would not be easy for many teachers to accept.

Summaries of Worldwide Teacher Training

Tom J. van Weert and Theo Kristel of The Netherlands described model syllabuses in computer literacy and computer science developed cooperatively by universities in The Netherlands for post-academic inservice courses. Introductory courses for teachers follow the content sequence developed for secondary school courses. The Dutch approach does not begin with programming for either students or teachers. Applications packages play a major role in all courses. Text processing serves as the first introduction to microcomputer uses.

Lars Runo Johansen from Denmark discussed teacher training in the social sciences, and emphasized that we must not only study the computer as a powerful social force in that discipline, but also train social scientists in the use of the computer as a tool for information storage and analysis.

Peter Gorney of West Germany outlined the way the Association for Teacher Education in Europe is fostering cooperation between teacher education institutions in Europe.

Barry H. Blakely of Chelsea College, University of London, presented seven case studies of teacher training programs in Great Britain including a system to involve teachers in creating computer-assisted learning software, a project to encourage the use of computers across the curriculum.

Dennis J. Harkins *attended the IFIP conference at the suggestion of* Dr. Sylvia Charp, *editor-in-chief of T.H.E. Journal, and U.S. representative to IFIP's Technical Committee on Education. He was in England on sabbatical to study the use of microcomputers in British schools.*

From the United States, Robert Taylor outlined a methods course for secondary teachers of computing science and a proposal for teacher certification standards developed by a task group of the Association of Computing Machinery. Richard Pollack from Minnesota described the Minnesota Educational Computer Corp. methods of teacher training.

LOGO is often recommended as the ideal language for introducing concepts of programming. It was the subject of much debate. Diane Martin produced a well-documented case study of a teacher training course in LOGO developed for the Arlington (Va.) County Public School System. It echoed some of my own experiences with the so-called "LOGO wall" which teachers face with some of the more abstract features of the language like recursion. A report from South Africa recounted the development of a course for teachers that started as a series of lectures, but evolved into a set of materials that allowed teachers to explore LOGO at their own pace. June Wright, in describing the Microcomputer Discovery Project at the University of Maryland, noted that observing children could perhaps lead the way to teaching teachers about computers—give them time to discover then play.

Another major discussion topic was software—how do we evaluate the deluge of educational programs we are beginning to see in so many subject areas? Two papers addressed this question, and a third outlined the approaches used to develop software for teacher training. Dr. Seong-Soo Lee, from the University of British Columbia in Canada, discussed the problem of evaluation, noting that the interactive capabilities of current computer hardware are not often put to good use with "electronic page turing." Research into feedback and other design elements can lead the way to better programming, he said.

Robert Lewis, from The Institute for Educational Computing at St. Martin's College in the U.K., discussed methods used to evaluate software. "The value of a classroom resource is first and foremost a function of the teacher/class relationship," Lewis said. "However good the design, however sound the structure, a piece of material will only be of value if it suits, supports or promotes human communication in the classroom."

Hence, the real evaluation of software must be done in classroom situations. It is most important to provide teachers with information to aid them in making that final judgment themselves.

A project of Britain's Open University has resulted in a logical solution to their problem of finding time for teacher inservice in the new technology. The "Micros in Schools" project produced a highly successful awareness pack for teachers which provided a first introduction to microcomputers. The pack made up about 40 hours of self-study instruction, complete with software. The design enabled teachers to learn about micros as their time and access to the equipment permitted.

Patterns Emerge

As the conference drew to a close, the discussion groups were not able to answer all the questions about teacher training in informatics. They did determine that the educational use of computers presents so many possibilities that it is likely even neighboring schools, much less distant countries, will find different activities and emphasis in their curricula.

But patterns are starting to emerge. We know that computer use will stretch across the curriculum as we see better software and more teachers involved in software development projects. Content-free software such as word processors and databases will find many uses in the classroom as they become more accessible to teachers. We know that teachers will want training in these applications as the possibilities begin to present themselves. Inservice training must provide a good part of that instruction.

The conference papers and discussions demonstrate the variety of responses to a worldwide revolution in information handling. But, if it wasn't the differences that impressed me on my first trip outside my own country, it was the similarities in our efforts, and a universal willingness to accept such a great educational challenge. J

Word processors and databases will find many uses in the classroom.

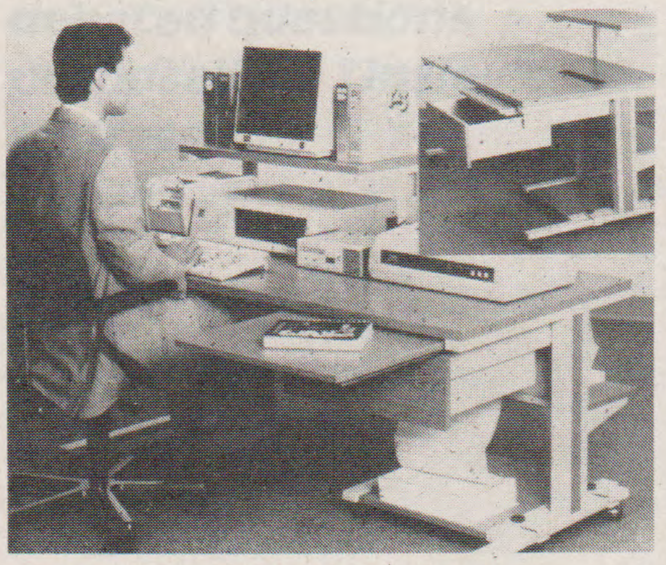
LOGO was the subject of much debate.

New Publications

New Workstation Featured in Catalog

A compact systems stand for small computers that is a combination workstation and printer stand is being featured in the new full-color, 100-page Fall/Winter catalog from Misco, Inc.

Among the design features of the new stand are an adjustable "print-a-porter" paper catcher which can be



SHELVES ARE ADJUSTABLE

adjusted for the length of the forms being printed, a slide-out work surface providing two square feet of additional space, and a height adjustable shelf that can be mounted on either the right or left side.

Also offered in the new catalog are a variety of supplies and accessories for computers and word processors. A copy is available free. *Misco, Inc., Holmdel, NJ.*

Write No. 511 on Inquiry Card

Programs Include Lesson Planners

Nearly 200 science and social studies titles are featured in the latest software catalog from Focus Media, Inc. Each of the programs listed comes with a Teacher's Lesson Planner containing program objectives, background information, teacher and student hints, test and homework questions and answers, and ideas for classroom use.

Programs include those that will run on Apple, Commodore 64, IBM PC and PCjr, Commodore Pet and TRS-80 computers. They are indexed by subject at the back of the catalog.

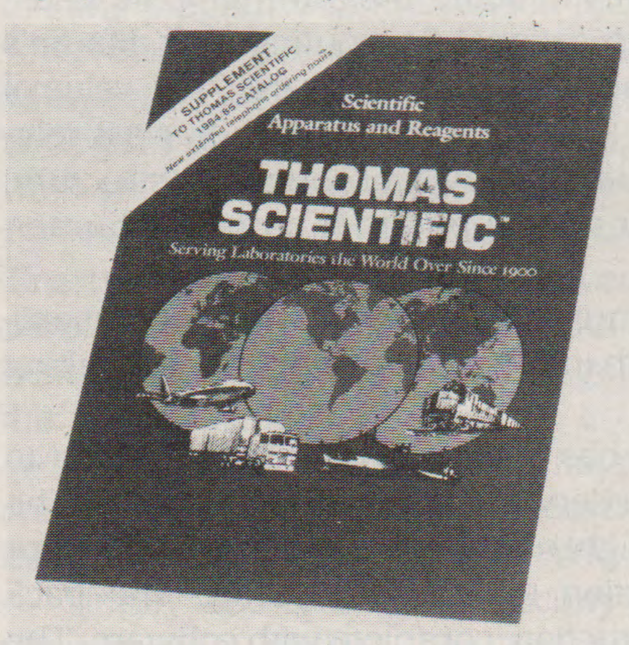
The catalog is divided into seven science categories, including physics, computer programming and chemistry; six geography categories, such as U.S. History and Economics. A table of contents also shows page numbers for programs by grade levels. *Focus Media, Inc., Garden City, NY.*

Write No. 543 on Inquiry Card

Laboratory Catalog Gets Supplement

Thomas Scientific has announced the publication of a 174-page supplement to the company's 1984/1985 Scientific Apparatus and Reagents Catalog.

The supplement contains 1,912 new product listings of laboratory equipment and supplies from major



LISTS 1,912 PRODUCTS

manufacturers plus a cross-referenced index. Products are listed in alphanumeric sequence, described and illustrated with photographs or drawings.

A free copy is available to school, company or institution laboratories. *Thomas Scientific, Swedesboro, NJ.*

Write No. 510 on Inquiry Card

Students Publish Their Own Books

Students may be introduced to the excitement of authoring, printing, illustrating and binding their own adventure story or autobiographical fantasy with software from the Playwriter Series. The programs are explained in a four-color brochure available from Grolier Electronic Publishing.

Also described are Friendly Filer, which introduces kids or adults to the basics of database management, and Treasure Hunter, which develops research skills by requiring players to read a companion reference book to find the treasure.

Easy Graph, another Grolier offering presented in the brochure, is said to simplify the task of teaching children in Grade 4 and up how to read, interpret and create graphs. *Grolier Electronic Publishing, Inc., Danbury, CT.*

Write No. 514 on Inquiry Card

Courseware Catalog Free to Educators

Simpac Educational Systems' 1984/85 educational software catalog is available free for all educators.

Courseware, authoring systems, interactive video, utility programs and hardware from Simpac are designed for junior high school through college and adult education.

Simpac programs are developed for the Apple family of computers. *Simpac Educational Systems, Gainesville, FL.*

Write No. 538 on Inquiry Card

Furniture Firm Offers New Catalog

The latest full-color, 31-page products catalog is now available from Bretford Manufacturing, Inc.

Bretford's line of products includes computer furniture, CRT & typewriter tables, office machine stands, library furniture, mobile equipment tables and video furniture.

Included in the catalog are photos and descriptions of mobile terminal tables, and adjustable universal printer stand, workstations, workstation accessories, workstation systems furniture, mini printer stands and CRT tables, adjustable microcomputer tables, typewriter stands, office machine cabinets and stands, mobile utility trucks, cabinet tables, media storage cabinets, audio/visual carts and stands, overhead tables, TV wall/ceiling mounting systems and security centers, and TV/VTR cabinets and stands. *Bretford Manufacturing, Inc., Schiller Park, IL.*

Write No. 524 on Inquiry Card

A/V Producer Publishes Catalog

Bergwall, a producer of audio/visual programs for vocational and technical education, announces its 1985 catalog which contains more than 185 programs, of which 14 are new this year.

The training programs are available on 35mm sound filmstrips, sound slides, and video transfer cassettes.

Topics include agriculture, automotive mechanics, computer literacy, cosmetology, Diesel mechanics, digital electronics, drafting, electricity, energy, food service, graphic arts, metal and machine shop, microcomputers, nursing, plumbing, pneumatics, residential wiring, robotics, general safety, welding and woodworking. *Bergwall, Garden City, NY.*

Write No. 526 on Inquiry Card

Educators Run Software Company

A new software catalog from Learning Lab stresses the involvement of educators in the company which along with selling software offers remedial tutoring for learning disabled students, subject tutoring and enrichment classes, all using computer-assisted instruction.

Software offered by the Learning Lab is available in the following areas: reading and language arts; mathematics; learning games; art and music; science; computer literacy; and test preparation and utilities.

A graph next to each entry tells the educator if the software will run on the Apple, Atari, Commodore or IBM microcomputers. *Learning Lab, Northridge, CA.*

Write No. 531 on Inquiry Card

Free Book Catalog Is Now Available

A free 16-page computer book catalog is now available from Microcomputer Applications.

Containing information including chapter contents and pricing, this catalog describes a variety of books, including tutorials on operating systems, word processing, language translators, and 8088 microprocessor design.

The catalog also offers a special discount for a set of four operating system books that describe 27 current microprocessor operating systems, soft's MS-DOS, and Bell Labs' UNIX. *Microcomputer Applications, Fairfield, CA.*

Write No. 533 on Inquiry Card

Suggestions Made For CAI Systems

In Educational Technology in Voc Ed, author Joseph I. Lipson presents an overview of the latest computer technologies and suggests applications for effective educational programs.

The 28-page publication provides a survey of new computer hardware and software and other technical breakthroughs, as well as a glossary to aid readers in understanding computer terminology. Examples illustrate effective industry training programs that use high technology.

A list of benefits of current computer-assisted vocational programs and consideration of environmental factors influencing the learning process support seven recommendations for designing effective computer-based instructional systems. *National Center for Research in Vocational Education, Columbus, OH.*

Write No. 513 on Inquiry Card

Newsletter Tracks W-P Innovations

A new publication called Research in Word Processing Newsletter serves instructors in academic writing programs who are using computers for on-screen editing and revision, text analysis, and related writing activities.

The newsletter also monitors literary and linguistic computing, providing guidance to literature programs attempting to apply word-processing techniques for both traditional and innovative purposes. A sample copy of the newsletter will be sent free to interested educators. *Research in Word Processing Newsletter, Rapid City, SD.*

Write No. 504 on Inquiry Card

Mini-Catalog Lists Business Software

Softsource, a distributor of business and developmental software for microcomputers, recently issued a mini-catalog to aid both users and dealers in selecting software for the IBM PC and compatibles.

The IBM/compatible catalog specifies business and developmental software that runs on the IBM PC or compatibles and features more than 140 applications from 34 software manufacturers. These include Digital Research, MicroPro, Microsoft, and SuperSoft.

Alphabetically organized by manufacturer, software descriptions represent 18 product categories and include operating system and memory requirements. *Softsource, Bedford, MA.*

Write No. 501 on Inquiry Card

Several Monitors Briefed in Handout

To answer increased demand for information, Zenith has designed a specification brochure for its line of monitors.

The fold-out brochure opens to give the basic specifications for eight of Zenith's monitors, which are pictured in color. Monitors shown include the 25″ diagonal screen CV-2560, which offers sound capability and both RGB and composite input.

Also pictured are three 12″ diagonal screen monitors and four different 13″ models. *Zenith Data Systems, Glenview, IL.*

Write No. 502 on Inquiry Card

Micro Packages Described by Uses

Instructional software packages designed for teachers and their students are explained in the Catalog of Microcomputer-Based Packages from Conduit, the University of Iowa's nonprofit courseware publisher.

The packages are listed by discipline: biology, chemistry, economics, education, languages, mathematics, music, physics, political science, psychology, sociology and statistics.

Each abstract describes the package by title, computer required, catalog number, topics covered, suggested courses, level, author and price. A brief narrative relates how the materials are used by students and teachers. *Conduit, Iowa City, IA.*

Write No. 516 on Inquiry Card

(continued on page 118)

Publications *(continued)*

DEC-Compatible Software Shown

More than 100 DEC-compatible software selections are listed in the new 1985 catalog from Midcom Corp.

In addition to the printed catalog, Midcom maintains an updated inventory of their programs stored on-line in the company's VAX-11/70.

New programs include InfoCen by 3CI and IMON from Bear Computer Sytems. Midcom also offers VAX/VMS timeshare services on a nationwide basis via Telenet. *Midcom Corp., Orange, CA.*

Write No. 534 on Inquiry Card

Computer Training Program Explained

A new brochure from the Education Division of Attache Software, Inc., explains the uses and benefits of the Protocol Computer Training Program.

The Protocol program is a series of eight modularized courses that train people in the use of accounting and productivity tool software application, and microcomputer hardware.

The four accounting courses are designed to give students confidence in operating accounting software on a personal computer, according to the brochure. Classroom exercises simulate the processing of normal business transactions using sample invoices, checks, accounts and more.

Subjects include general ledger, accounts payable, accounts receivable/invoicing and sales analysis, and inventory and invoicing.

All courses may be completed in seven hours, according to the brochure. *Education Division, Attache Software, Inc., Ann Arbor, MI.*

Write No. 523 on Inquiry Card

Mathematics Council Publishes Guidelines

Guidelines for Evaluating Computerized Instructional Materials, described as the first national response to questions about evaluating instructional software, has been updated.

The Guidelines have been an aid for users and creators of instructional computer software since their release in 1981, according to the publishers, the National Council of Teachers of Mathematics.

Also available from NCTM is The Computer Resource Kit, which contains complete information about the council's computer activities and information about services and products.

Write No. 521 on Inquiry Card

Report Reveals Changing Trends

A new report from the Department of Education presents statistical evidence of recent trends in the American educational system, from kindergarten through graduate school.

Published by the National Center for Education Statistics, The Condition of Education, 1984 explains how social and demographic changes have affected American education over the past decade, and, based on these trends, projects the outlook for the near future.

According to the report, enrollment in elementary/secondary school, which decreased in unprecedented numbers during the 1970's, will continue to decline until 1985. Total enrollment is then expected to reverse its downward trend and increase slowly as the school-age population begins to grow.

The report is available for $7. *U.S. Government Printing Office, Dept. 36-HR, Superintendent of Documents, Washington, DC 20402.*

Micros and ESL Discussed in Report

Microcomputers and Teaching English as a Second Language is the seventh in the Research Monograph Series published by the Office of Academic Affairs' Instructional Resource Center at The City University of New York.

The 52-page report by Gerard M. Dalgish, ESL supervisor at Baruch College in New York, makes a case for the use of computers in teaching ESL, provides guidelines and suggestions for evaluating or creating software and programs, and reviews some of the most representative software.

This software includes materials from the Minnesota Educational Computer Corp. (MECC), Regents/ALA, BIPACS, Dormac, Computer Curriculum Corp., Hartley Courseware Inc., Teacher's Friend and Plato. *The City University of New York, Office of Academic Affairs' Instructional Resource Center, 535 E. 80 St., New York, NY, 10021.*

Library Automation Shown in Brochure

A brochure titled A Quick Guide to Automating Your Library is now available from Sydney Dataproducts, Inc.,

The brochure is an introduction to Sydney's Easy Data Integrated Library System which can be used to computerize most library tasks.

The system, designed by librarians for public, school, special and academic libraries of up to 150,000 titles, comprises five modules: Cataloging/Inquiry, Acquisitions, Circulation, MARC Record Interface and Serials. This modular approach allows a library to automate basic functions for a relatively modest initial cost and then expand as the need arises, according to the company. *Sydney Dataproducts, Inc., Sherman Oaks, CA.*

Write No. 540 on Inquiry Card

Management System For Small Districts

The Burroughs B 20 computerized Accounting and Student Terminal System (CASTS) is a state-of-the-art, fully integrated educational management software system designed to interface administrative departments within a school district, or, a single institution, according to a brochure just released from Burroughs Corp.

CASTS is especially designed for school districts with less than 2,000 students and 300 employees.

Made to run on the Burroughs B 20 microcomputer system, CASTS provides administrators with on-line/real-time management information presented in a logical, manager-oriented fashion, according to the brochure.

Systems provided by CASTS include an Elementary and Secondary Student Accounting System, a Fund Accounting Financial System, Payroll System, Inventory System, and Personnel System. *Burroughs Corp., Detroit, MI.*

Write No. 525 on Inquiry Card

Catalog Describes CCTV Product Line

Closed-circuit TV cameras and video products are described fully in a new mini-catalog available from RCA Closed-Circuit Video Equipment.

The 24-page booklet provides photographs and technically detailed product descriptions for the video products.

The booklet features cameras from economical, general purpose models for daylight and normal interior scenes to sophisticated models for bright sunlight or starlight conditions; monitors from 5″ to 19″ diagonal; basic minisystems and surveillance kits; time-lapse recorders; switchers; scanners; time and date generators and other systems components.

The booklet's inside cover provides a table of contents, an index by product type and useful technical notes; footcandle to lux and lux to footcandle conversion factors; typical scene

VIDEO EQUIPMENT SHOWN

illumination specifications and CCIR requirements. The back cover features a listing of the RCA sales representatives in the United States, Canada and overseas. *RCA/Closed-Circuit Video Equipment Division, Lancaster, PA.*

Write No. 537 on Inquiry Card

Catalog Features Workstation Guide

Data processing furniture, ranging from coordinated groups to single units, is featured in a new 1985 planning guide from Devoke Data Products.

Workstations shown range from basic to highly specialized units, including several designed specifically for microcomputers.

Accessories and supplies are also featured in this 80 page order-direct catalog. *Devoke Data Products, Santa Clara, CA.*

Write No. 529 on Inquiry Card

Software Offered For 1984/85 Year

The latest software catalog from Sterling Swift Publishing Co. offers software and texts for the 1984/85 school year.

In addition to Swift's line of courseware products, the company's acquisition of Camelot Publications has added to Swift's inventory, according to the catalog.

Categories of titles include computer literacy, LOGO, curriculum software, BASIC programming and educational tools for teachers and administrators. *Sterling Swift Publishing Co., Austin, TX.*

Write No. 539 on Inquiry Card

(continued on page 120)

Publications *(continued)*

Catalog Describes Training Seminars

An 80-page catalog, available from Arthur Andersen & Co., lists and describes that firm's training seminar services.

Highlighted are 50 seminars offered by the firm. Each description begins with an overview of the course content, followed by a section outlining the personnel who could best benefit from the seminar.

Another section defines the skills or knowledge each participant should attain after completing the seminar. The professional background of the instructors are given as well as teaching materials and methods.

Pricing information, length of the seminar and continuing professional education credits are also listed.

Arthur Andersen's curriculum includes courses in six major fields: accounting and finance, auditing, management development, information systems, specialized industry and tax. *Arthur Andersen & Co., St. Charles, IL.*

Write No. 518 on Inquiry Card

Brochure Describes Business Computer

A 12-page, full color brochure from NCR Corp. describes that company's Decision Mate V personal computer for business.

According to the brochure, the unit features an 8/16-bit dual processor.

The computer comes with dual 5¼" floppy disk drives, and has a 64-Kbyte memory expandable to 512 Kbytes.

It utilizes the CP/M-80 operating system for its 8-bit processor. The dual processor can use either CP/M-80, CP/M-86 or MS-DOS. These operating systems support programming languages such as BASIC, COBOL and PASCAL.

Decision Mate V computers may be tied together in a network using the NCR Decision Net system which comprises two components, the NCR Omninet local area network and the NCR MODUS file sharer, according to the brochure. *NCR Corp., Dayton, OH.*

Write No. 535 on Inquiry Card

Social Studies Programs Examined

Computing in the Social Studies Classroom is a 50-page booklet written by Allen Glenn of the University of Minnesota and Don Rawitsch of the Minnesota Educational Computing Corp.

It contains seven chapters with titles such as, How Can Computers Be Used in Social Studies? Where Can Social Studies Materials Be Found? and How Does Computing in Social Studies Fit Into the School's Overall Instructional Program?

The booklet is published by the International Council for Computers in Education, a non-profit professional organization dedicated to improving educational uses of computers.

Write No. 520 on Inquiry Card

Text Titles Cover Computer Sciences

Computer Science Press, Inc. is offering complimentary copies of their 1984-1985 catalog of computer books and software. School and college textbooks include such introductory titles as Computers Today and Tomorrow: The Microcomputer Explosion, and Foundations of Computer Science. More technical texts include Computational Aspects of VLSI, and Algorithms for Graphics and Image Processing.

Among the subjects represented in the catalog are computer science theory, programming languages, computer design, math and computers, electrical engineering, communications, signal processing and computer education.

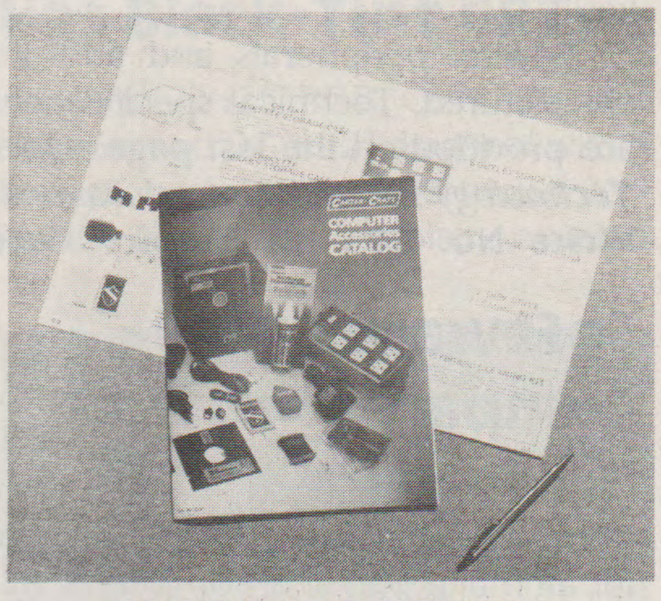
The Journal of VLSI and Computer Systems, and The Journal of Telecommunications Networks also are available through the 32-page catalog. *Computer Science Press, Inc., Rockville, MD.*

Write No. 517 on Inquiry Card

Accessories Shown In Computer Catalog

A new, completely illustrated, four-color computer accessories catalog is now available from Carter-Craft.

The catalog features dust covers and cables for Commodore computers.



COMPLETELY ILLUSTRATED

In addition is a collection of diskette storage cases including a diskette travel case.

Featured safety products include surge protectors with resettable circuit breakers to guard against overload and prevent the loss of data. *Carter-Craft Corp., Rockford, IL.*

Write No. 528 on Inquiry Card

Booklet Illustrates On-Line Methods

How to access on-line information services is explained in a new booklet from Dialog Information Services, Inc. Illustrations of screen displays the Dialog user would see are accompanied by step-by-step explanations.

The booklet covers equipment needed to search Dialog databases, and descriptions of the contents of the databases.

Databases detailed in the booklet include: Education, Reference; Humanities, Social Sciences; Business, Industry, Corporate; Chemistry; Medicine, Biosciences; Science, Technology; and several others. *Dialog Information Services, Inc., Palo Alto, CA.*

Write No. 515 on Inquiry Card

Pamphlet Explains Integrated Package

A pamphlet from NCR's software library describes the Peachtext 5000 integrated software package.

The product includes word processing, spreadsheet analysis, database/mailing list capabilities, and electronic thesaurus and a spelling checker program.

Peach Text is the word processing system that can prepare, revise and store documents. Random House Electronic Thesaurus is a software version of the reference book that allows the user to display, choose and substitute synonyms for words on the document currently being created or revised.

Spelling Proofreader is an automated spell-checking program that helps isolate spelling and typographical errors utilizing an expandable 20,000-word dictionary. List Manager allows control over the design and use of mailing lists, labels and other files. Peach Calc is a spreadsheet program enabling the user to analyze numerical and financial data. *NCR Corp., Dayton, OH.*

Write No. 536 on Inquiry Card

Pavlovian Theory Trains New Typists

Both conscious and unconscious techniques are used to turn inexperienced students into typing masters in just six hours, according to a brochure describing the Keyboard Development training package from Prep, Inc.

The folder explains the scientific theory behind the videocassette training series. The cassettes can be used at small monitors to train individuals or on a large-screen system to teach groups.

The back page of the brochure provides a representative list of more than 4,500 educational facilities, corporations and government installations using keyboarding programs developed by the staff of KT Research and Development, creators of the new series. *Prep, Inc., Trenton, NJ.*

Write No. 508 on Inquiry Card

Business System Shown in Brochure

The Executive Accounting System (EASY) is the general business accounting and management program for the Burroughs B 20 Systems which includes the B 25 Modular Business Computer.

EASY applications for schools and businesses are outlined in a full-color brochure available from Burroughs.

According to the brochure, EASY automates and streamlines accounting and reporting functions for order entry and invoicing, receivables, payables, inventory, payroll and general ledger. The EASY Budgetary Accounting System is designed for schools, governments and other institutions using fund accounting. The system controls and reports on the organization's revenue, encumbrances and expenditures, the brochure says.

The brochure also describes the Executive WRITEone, the word processing program for the B 20 System, and the EASY Plan which interfaces EASY general accounting data files into MultiPlan spreadsheets for financial modeling, analysis and graphing. *Burroughs Corp., Detroit, MI.*

Write No. 527 on Inquiry Card

Semi-Annual Catalog Has 'Best Buys'

Quill Corp.'s new semi-annual general catalog of office and microcomputer products is now available.

Among 44 Quill "Best Buys" featured in the catalog are products such

MORE THAN 8,500 ITEMS

as flexible disks, a new calculator, a steno chair, a vinyl chair mat and a microcomputer stand.

More than 8,500 products described in this 264-page catalog are guaranteed for the full six-month life of the book. *Quill Corp., Lincolnshire, IL.*

Write No. 522 on Inquiry Card

(continued on page 122)

Publications *(continued)*

Teacher-Produced Software Offered

Programs from a company started by a group of computer teachers from the metropolitan Detroit area are described in an illustrated booklet available from Midwest Software.

The company's programs now are being produced under license by Commodore Business Machines and Intelligent Software in the United States, as well as by an Australian company.

The booklet describes Master Grades, a grade management system for teachers; The Bottom Line, a general ledger program for school or small business; Testmaster for test and quiz development; Kinder Koncepts for introducing young children to the computer; and others.

Also explained are the company's preview and multiple purchase policies. *Midwest Software, Farmington, MI.*

Write No. 512 on Inquiry Card

Brochure Shows Evaluator Features

A full-color, fold-out brochure from RTI Video Products Co. describes how the Professional Videotape Evaluator/Cleaner detects videocassette defects. The four-channel system allows professional videotape producers to eliminate re-dubbing time and costs.

Standard features and specifications are given and an optional printer system is detailed. The fold-out also shows how the RTI machine protects VCR video, audio and control track heads.

Testimonials from various educational and professional owners are presented on the last page. *RTI Video Products Co., Lincolnwood, IL.*

Write No. 505 on Inquiry Card

New Color Computer Has Three Screens

Video Technology Ltd., has announced the availability of a full-color brochure describing the Laser 200 Color Computer.

Features explained in the four-page brochure include the built-in Microsoft BASIC language, which allows for graphics programming in nine colors. The interface cords included to connect the Laser 200 to a TV or monitor are shown.

Also explained are the computer's three different screen modes, each of which may be accessed with a single key.

Several peripherals and add-ons are pictured. Technical specifications are provided on the last page. *Video Technology Ltd., Elk Grove Village, IL.*

Write No. 503 on Inquiry Card

Software Guide Compares Products

The Omni Complete Catalog of Computer Software covers software for all major personal computers. According to its publisher, the book reviews in depth, evaluates and compares nearly 1,000 of the best and most commonly used programs.

Features of the guide include a review of public domain software; advice from more than 80 computer experts on what software to buy; compatibility listings for Apple, IBM, Atari, Radio Shack and Commodore computers; and up-to-date prices. *MacMillan Publishing Co., New York, NY.*

Write No. 532 on Inquiry Card

Booklet Answers What is Janus/Ada?

What is Ada? and What is Janus/Ada? are two of the questions answered in a 14-page booklet from Software, Inc. The booklet explains the highly structured Ada programming language developed by the Department of Defense, and Software's implementation of Ada for microcomputers.

Advantages to using this particular programming language are discussed. Compilers, assemblers and other Janus/Ada tools such as a disassembler, a syntax checker and a profiler are also covered.

A complete list of systems for which the Janus/Ada compiler is available appears at the end of the booklet, along with the company's price list. *Software, Inc., Madison, WI.*

Write No. 506 on Inquiry Card

New Products

RGB Color Monitor Has Black-Tint CRT

The CC-121 RGB Color Monitor from Roland DG is 12″ diagonal with a resolution of 640 by 200 (non-interlaced). The .0148″ dot pitch, coupled

OPERATES WITH VARIETY OF PCS

with a black-tint CRT, enables the monitor to produce black and white characters of extreme crispness and bright colors, according to the manufacturer.

A square eight-pin connector attaches to the back of the monitor and will operate with a variety of personal computers including Apple and IBM.

In addition, Roland DG will be marketing their own RGB color cards to interface with certain computers. *Roland DG, Los Angeles, CA.*

Write No. 324 on Inquiry Card

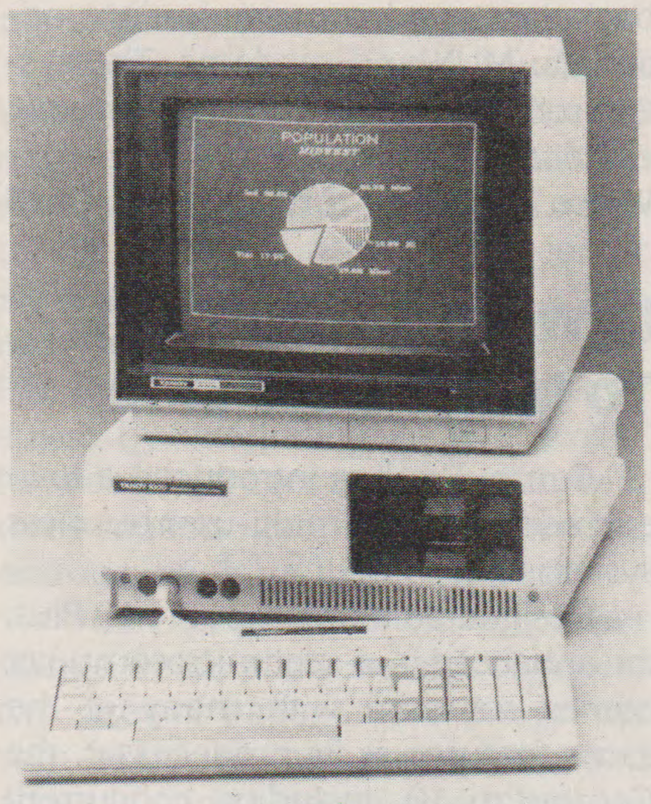
New 256-Kbyte Micro Introduced

New from Radio Shack is the Tandy 1000, a 256-Kbyte personal computer which offers almost all the performance and expansion capability of the IBM PC, company officials say.

The business-oriented system will come equipped with two built-in disk drives, a color monitor, a printer connection, color graphics capability, sound capability, and connections for two joysticks.

The base model of the Tandy 1000 will come with 128-Kbytes of RAM and one disk drive.

Included with the computer is the



BUNDLED WITH SOFTWARE

MS-DOS operating software and an integrated software program written by Radio Shack that incorporates word processing, spreadsheet, database, appointment calendar, calculator, telephone directory and telecommunication. *Radio Shack, Fort Worth, TX.*

Write No. 329 on Inquiry Card

Multi I/O Board Includes Software

AST Reasearch, Inc.'s new Multi-I/O board for Apple IIe computers, now includes an on-disk tutorial program and a clock read/set, text file listing, graphic dump, phone dialer, modem or remote terminal print, and screen time display utilities package at no additional charge, according to the manufacturer.

The clock read/set utility makes it possible for users to time and date "stamp" documents once the clock has been set through ProDOS. The text file listing utility allows users to display a text file on the screen, eliminating the programming ordinarily required to do this operation. Designed to support Apple's Imagewriter, the graphics dump utility makes it possible to print screen displays including both text and graphics.

The modem or remote terminal print utility allows users with a modem to access database services with simultaneous print capabilities. Designed for intelligent modems, the phone dialer utility offers the ability to store and automatically dial phone numbers for both voice and data communications.

Included with the utilities package is an on-disk tutorial program and complete documentation that provides easy to learn instructions for the operation of each utility. *AST Research, Inc., Irvine, CA.*

Write No. 312 on Inquiry Card

Hard Disk Extends Computer's Memory

A hard disk extension of the MicroMate computer is now available from Personal Micro Computer, Inc.

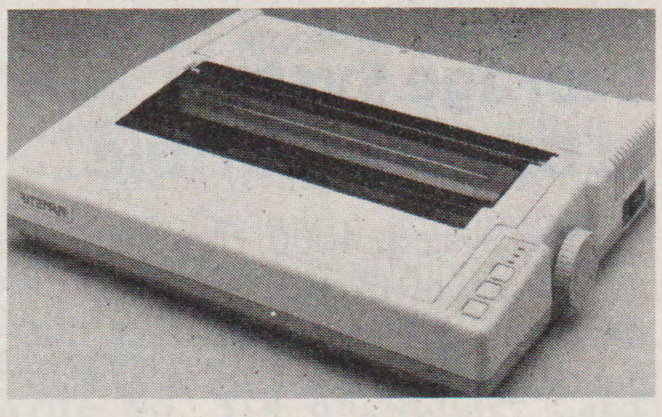
With the addition of the 10-Mbyte hard drive which is expandable to 20-Mbyte, the MicroMate has capabilities beyond other CP/M computers and is equivalent to many 16-bit computers, according to the manufacturer. *Personal Micro Computers, Inc., Sunnyvale, Ca.*

Write No. 307 on Inquiry Card

Printer Operates In Three Modes

At a speed of 140 cps, the Riteman Blue Plus prints numbers, words and graphics with high resolution capacity, according to the manufacturer.

Using a 9 by 9 dot matrix, the Blue Plus comes with a standard 96-character ASCII set plus eight international



LOGIC-SEEKING GRAPHICS

character sets and 32 block graphic characters.

Having three modes of operation; IBM Graphics Printer, Epson RX FT and MX 80 FT Graf Trax Type III, its manufacturer considers it three printers in one.

Featuring logic seeking graphics and a quad-density mode, the Blue Plus provides 128 different typestyles.

The printer comes equipped with friction and pin feed with an option for an adjustable tractor feed for fanfold, roll or sheet paper. *Riteman Computer Printers, Inglewood, CA.*

Write No. 308 on Inquiry Card

(continued on page 124)

Products *(continued)*

Bench Mill Trains Students

Brodhead-Garrett Co. has introduced Triac, a 3 axis CNC bench mill.

Designed for technical colleges and training centers, Triac features a 5″ anti-glare programming VDU and 12″ TV monitor to display toolpath graphics. The alphanumeric, profiled keyboard allows full manual data input, with single step and auto selector for programs, according to the manufacturer.

ISO format allows G and M code programming, with optional full code listings on the VDU. The control system provides circular interpolation on the X-Y plane, and repeat facility for drilling and pocket milling cycles and a programmable dwell function.

Triac features a built-in solar powered calculator and step-by-step audio cassette to assist students. In addition, it offers full off-line microcomputer programming with high resolution color toolpath graphics and an RS-232C computer link. A tool kit, guards and instruction manual is included. *Brodhead-Garrett Co., Cleveland, OH.*

Write No. 313 on Inquiry Card

Storage System Is DEC Compatible

The System 4000, complete with a 300-Mbyte fixed Winchester disk drive and a 45-ips, nine-track magnetic tape drive backup, is available from Unitronix Corp.

The product offers total emulation of RSTS/E, RSXIIM, UNIX and TSX, and a 256-Kbyte to 8-Mbyte MOS memory.

According to the company, System 4000 can utilize the DEC PDP-11/23 Plus, 11/24, 11/44 or VAX processors as the heart of its configurations. It is also compatible with existing 18-bit DMA controllers or Q-bus interfaces as well as the new 22-bit devices.

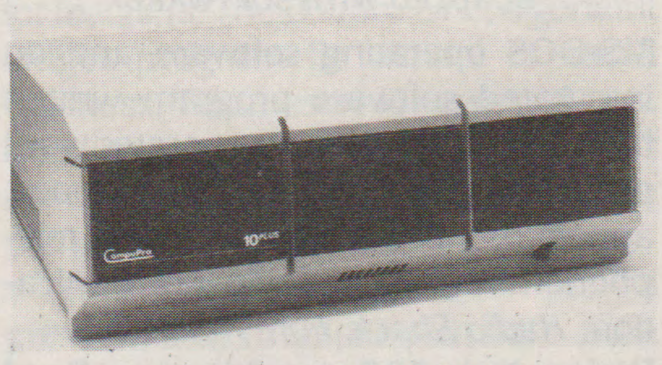
Additional features of the System 4000 include a peripheral bus mapping module, an 18- and 22-bit LSI-11 backplane, four- to 16-port serial interface for terminals, a large 6 by 9 backplane, and communications options to MUX and modems. The system runs on DEC diagnostics. *Unitronix Corp., Somerville, NJ.*

Write No. 310 on Inquiry Card

Low-End Addition To Multi-user Line

CompuPro has introduced a low-end addition to its multi-user business systems line.

Designated the CompuPro 10 Plus, the enhanced four-user microcomputer comes standard with many of the same features as its predecessor, the CompuPro 10, including concurrent



FOUR-USER MICROCOMPUTER

execution of both 8-bit and 16-bit industry-standard software and networking capabilities. However, its performance has increased as much as 25 percent at a 20 percent cost decrease, according to a company spokesman.

The CompuPro 10 Plus features a new operating system—Concurrent CP/M 8-16—which has been benchmarked at being 25 percent faster than MP/M 8-16, the operating system offered with the CompuPro 10. Included is a word processing package called NewWord, a WordStar workalike, the spokesman said.

Write No. 316 on Inquiry Card

Bubble Memory Featured in Board

Two expansion boards from Helix Laboratories, Inc., one for the Apple II and IIe and one for the IBM PC, feature bubble memory.

The Helix PC Bubble Disk is the first half-megabyte bubble memory expansion board for the IBM PC, according to the manufacturer. Formatted as a fixed disk, the Bubble Disk operates off the computer's power supply without requiring increased or external power.

The PC Bubble Disk responds to fixed disk commands under most operating systems including PC-DOS 2.0, Softech PASCAL IV.13 and CP/M-86 for the IBM PC XT.

The Helix ABM Bubble Module is a 128-Kbyte bubble memory expansion board for the Apple II and IIe microcomputers. It too operates off the computer's power supply.

It comes with Bubbleware to enable it to operate as a floppy disk under DOS 3.3, Apple PASCAL 1.1. and Microsoft CP/M including the capability to execute a boot from power-up in any of these systems. *Helix Laboratories, Inc., Canoga Park, CA.*

Write No. 327 on Inquiry Card

Vacuum Cleaner Designed for Micros

The Mini-Vac vacuum cleaner is a lightweight device designed to remove minute particles of dust and debris from hidden or hard to reach areas, like those found on microcomputers and other high-tech equipment.

Unlike compressed air which simply disperses the pollutants, Mini-Vac vacuums them away permanently, according to the manufacturer.

The cleaner comes equipped with two interchangeable wands, two fine bristle brushes; and a cloth vacuum bag. It can be DC or AC powered.

The Mini-Vac can also be used on cameras, video equipment, typewriters, records and lenses. *Mini-Vac, Inc., Glendale, CA.*

Write No. 321 on Inquiry Card

Mounting System Locks Hardware

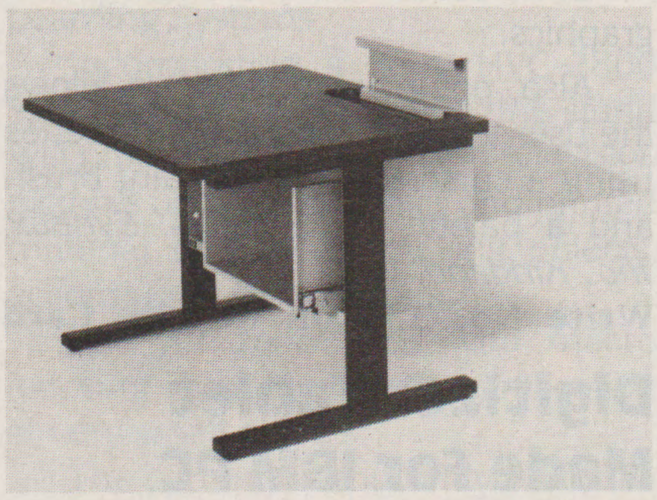
Security mounting systems from Brady Enterprises protect computer hardware, word processing equipment, TV monitors, VCRs, typewriters and other related hardware, by securing them to the table, a company spokesman said.

Steel plates interlock to prevent theft and unauthorized access. The mounting systems, manufactured by Lucasy Manufacturing Company, Inc., come in both bolt-down and glue-down models. *Brady Enterprises, Chicago, IL.*

Write No. 301 on Inquiry Card

Printer Stand Has Many Features

The Terminal Printer Stand from Dennison Monarch Systems, Inc. has many features including a design to allow a full box of blank printout forms to load onto an optional receiver



ADJUSTABLE LEVELING GLIDES

rack. The opening in the top of the stand and the receiver rack are off-center to provide additional work surface.

The stand comes with adjustable leveling glides and a laminated work surface. It measures 36″ wide by 30″ deep and is adjustable from 25″ to 27″ high. *Dennison Monarch Systems, Inc., New Windsor, NY.*

Write No. 303 on Inquiry Card

Desktop Furniture For Existing Desks

A modular family of ergonomic desktop computer furniture is now available from Donnay Technology.

This line of computer furniture has proven to be cost effective because existing classroom or office desks may be utilized and achieve the same

PC ORGANIZER MODEL

ergonomic results as more expensive computer furniture, according to the manufacturer.

The products include Touch-Tilt video pedestals which combine 15 degree tilt and 360 degree rotation in nine standard sizes; Bi-Swivel turn-tables which feature offset center swivels that extend keyboards within easy reach of several operators; and PC Organizers which free desktop space by integrating tilt and swivel, keyboard storage, power switch with three outlets and surge protection, and security from theft or misuse.

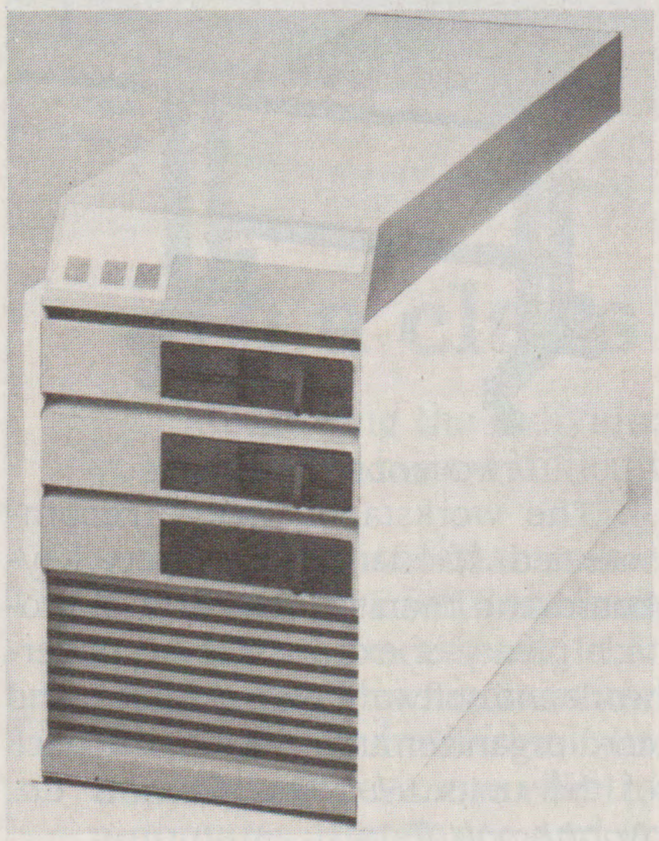
Other products include printer stands which allow storage of one or two sizes of paper under the printer with center or rear paper feed, and acoustic printer stands which provide noise reduction, a dust-free environment and paper storage.

Standard configurations are available for all popular microcomputers, printers and terminals. They are available in walnut, oak, putty, apple and IBM colors. *Donnay Technology, Santa Ana, CA.*

Write No. 318 on Inquiry Card

Disk Duplicator Designed for Desks

The new IC-4100 desktop floppy duplicator from Applied Data Communications handles either 3½″ or 5¼″ single-sided or double-sided,



HANDLES 550 FORMATS

single-density or double-density disks.

Capable of working with 550 formats, the copier comes in a standard three-drive configuration that allows copying of two disks simultaneously in 17½ seconds per disk.

For increased volume duplication, ADC has designed the RDH 3.5 Robotic Disk Handler/Loader that works with the IC-4100 to handle up to 50 3½″ disks with a load/unload time of 1.4 seconds. *Applied Data Communications, Tustin, CA.*

Write No. 302 on Inquiry Card

New System Links Mini-Lathe, Micro

Starturn is a desktop DNC training system that links a mini-lathe to a microcomputer and is new from Brodhead-Garrett. Developed for schools, colleges or training centers, Starturn is designed to teach all the essential skills required for operating larger production lathes, according to the manufacturer.

Featuring variable speed drive, the system includes an RS-232C interface for connection with microcomputers, a floppy disk and a cassette tape. Software controls feature circular interpolation and screwcutting with specified pitch in inches or metric, while programming can be inch or metric and absolute or incremental.

Starturn has standard ISO input and memory size up to 100 blocks with full edit mode. Other functions include a do-loop facility which enables repeat cycling for turning, facing, pecking and grooving, plus a dwell function.

High-resolution toolpath graphics for program verification can be produced on the micro and programs can be dumped to a printer if hard copy is required. *Brodhead-Garrett Co., Cleveland, OH.*

Write No. 314 on Inquiry Card

Interface Card Emulates IIc Ports

The new Alphabits serial interface card for the Apple II emulates the portable IIc's serial ports, allowing Apple II users to run all software written for the IIc.

Included is a Zoom Grafix high-resolution graphics screen printing package with mouse interfacing capabilities as well as a IIc-compatible cable/connector. *Street Electronics, Carpinteria, CA.*

Write No. 332 on Inquiry Card

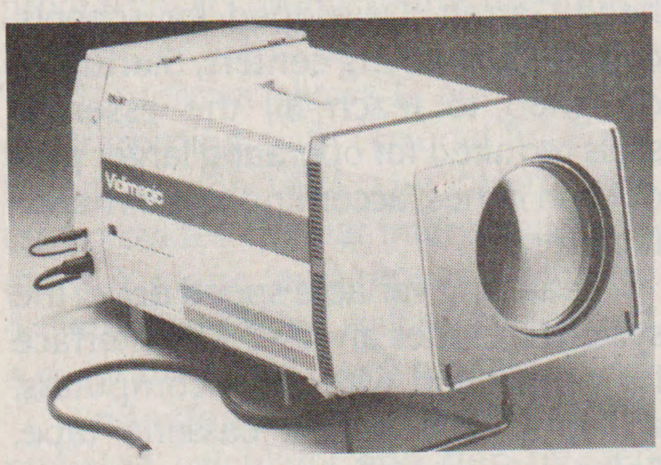
(continued on page 126)

Products *(continued)*

Projection System For Educational Use

Vidimagic Model FP-60 is Sony's new video projection system for educational and industrial video presentations.

It features a video projector, a Betamax video tape player/recorder, a cable-compatible TV tuner and built-in public address system. The Vidimagic FP-62 offers all the same



FP-60 VIDEO PROJECTOR

features as the FP-60, but without the video player/recorder.

The single Indextron tube in the projector eliminates the necessity for picture tube registration on the screen, according to the manufacturer. All the user has to do is focus using a motor-assisted system similar to a slide projector. Its picture can be from 30″ to 200″ diagonal and can be projected at angles from 7 degrees to 20 degrees.

An optional RM-27 remote control/microphone unit controls the built-in videocassette recorder's play/stop/rewind/fast forward and pause functions, and projects the speaker's voice through the public address system. *Sony Corporation of America, Park Ridge, NJ.*

Write No. 309 on Inquiry Card

CCTV Monitors For Educational Use

Two 12″ and 15″ monochrome models are available from the RCA Closed-Circuit Video Equipment line of CCTV monitors.

Both monitors feature front panel controls and bright 14 KV displays. Regulated power supplies and solid state circuitry enhance picture quality and reliability, according to the manufacturer.

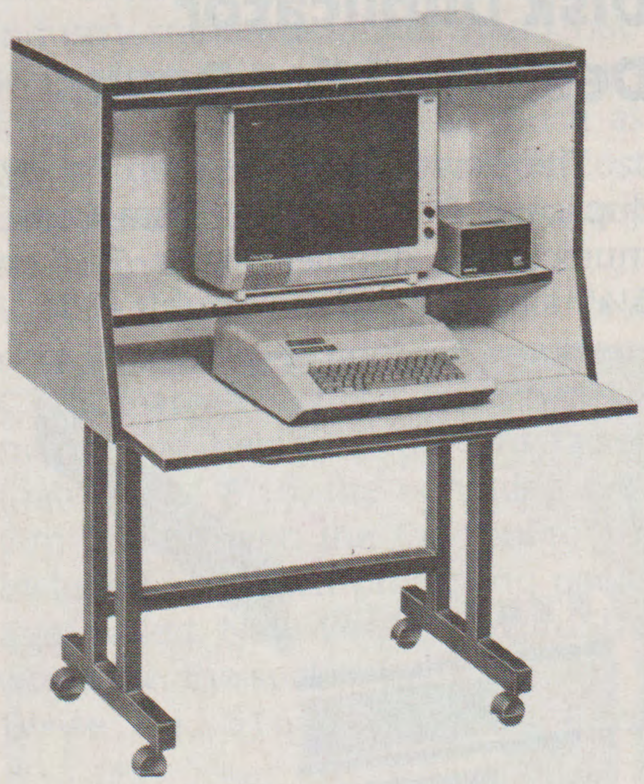
The TC1112 is a compact 12″ monitor with 700-line resolution. The TC1115 is a high resolution 800-line, 15″ monitor with switchable restoration and a normal/sharp selectable picture. Both monitors can be used for educational applications, including videocassette recording. *RCA Closed Circuit Video Equipment, Lancaster, PA.*

Write No. 334 on Inquiry Card

Line of Workstations Are Fully Lockable

The Maximus line of lockable workstations from the Hubbard Scientific Co. offers a choice of computer-compatible styles to house and protect hardware and software, and provide an efficient working environment, according to the manufacturer.

Models include the Big Max and Little Max that secure keyboards, monitors, disk drives and software under lock and key to prevent theft, accidental or malicious damage and unauthorized use.



TWO MODELS AVAILABLE

The workstations meet recommended standards for correct keyboard and monitor heights, and provide plenty of extra space for paperwork and software. Power outlets and cord organizer are built into the back of the units. *Hubbard Scientfic Co., Northbrook, IL.*

Write No. 339 on Inquiry Card

Sprite Graphics Cards for Apple

Two versions of sprite animation peripheral cards for Apple computers are available from Synetix, Inc.

The Sprite I lets Apple users define, assemble and move sprites for educational programs.

Sprite II adds a sound generator, speaker and software for programming sound effects synchronized to the sprite action.

Both cards feature multi-plane graphics.

Also, paint brush software allows the user to create background scenes using a cursor-controlled paint brush and a palette of 16 colors. *Synetix, Inc., Kirkland, WA.*

Write No. 333 on Inquiry Card

Digitizer Tablet Made for IBM PC

The VersaCAD digitizer tablet provides for precise, easy input as a drafting system, according to its manufacturer, T&W Systems, Inc.

The product features a built-in power supply and a standard RS-232C serial port. It has up to 200 ppi resolution and accuracy to within .025″. *T&W Systems, Inc., Huntington Beach, CA.*

Write No. 351 on Inquiry Card

Peripheral Links PCs Into Networks

The PC-Handler from Synetix, Inc. allows up to four IBM PCs to be linked into a shared resources network.

The product plugs into the IBM PC expansion slot and acts as a data control center to let additional PCs share information and peripherals at a fraction of the cost of other alternatives, according to the manufacturer.

PC-Handler features two serial ports, four IBM-compatible parallel ports, a clock and calendar, spooling capability, and disk emulation. It is offered with 64 Kbytes of memory which is optionally expandable up to 512 Kbytes and 2 Mbytes when 256-Kbyte chips are available.

The print spooling capability allows printing or plotting to occur off-line at any pre-specified time. A resident RAM emulation program lets programs run exceptionally fast by devoting a portion of memory to simulate the IBM PC floppy disk drive. *Synetix, Inc., Kirkland, WA.*

Write No. 330 on Inquiry Card

Projection Stand Has Macro Focus

The VID-5000 Visual Projection Stand is available from Sony Corp.'s AV Product's Group through Educational Electronics Corp., sole U.S. distributor for Sony AV Products and Learning Systems.

Incorporating a Sony HVC-2800 SMF Trinicon color camera, the stand will produce high-resolution television pictures of slides, graphics and printed material as well as moving objects, according to the distributor.

The 8:1 zoom lens with macro focusing provides high magnification of very small objects.

The camera output may be fed to monitor or projector for viewing, or to a video recorder for later viewing.

The stand will accommodate the Kodak Ektragraphic III AT projector on a self-storing shelf, according to the distributor. *Educational Electronics Corp., Inglewood, CA.*

Write No. 317 on Inquiry Card

Hard Disk System Boots Like IBM XT

The 10-N-10 dual 10-Mbyte removable hard disk cartridge subsystem from Xcomp allows IBM PC and PC compatible users to have unlimited storage, backup and archive media, supporting multiple operating systems, according to the manufacturer.

The unit boots up like an IBM XT and is based on Winchester technology. Users can replace low-speed floppies with the 10-Mbyte hard disk cartridge that has a life span five times greater than other removable media, according to the manufacturer.

Each drive has an on-board microprocessor which enables the drive to write the servo information on the blank cartridge during the formatting process. Once formatted, the cartridge is interchangeable with all other Xcomp 10-N-10 subsystems. *Xcomp, San Diego, CA.*

Write No. 325 on Inquiry Card

Apple-Compatible Network Introduced

Claiming compatibility with all Apple II software, including protected and interactive programs, Wolsten's Computer Devices, Inc. has introduced two versions of its new Apple/Franklin network.

The Network 816 permits connection of 16 Apple II computers to one or two Apple disk drives. The Network 808 supports eight Apple-compatible computers.

Students can select a program in either drive 1 or 2, but the teacher has control of the diskette. Students never touch the magnetic medium.

Since the Network 816 and 808 are hardware devices, no passwords or special commands are required, neither is a master or dedicated computer, according to the manufacturer.

Installation is completed using a single-ribbon cable and an interface card per computer. *Wolsten's Computer Devices, Inc., East Orange, NJ.*

Write No. 372 on Inquiry Card

(continued on page 128)

Products *(continued)*

Robotics System Comes in Kit Form

Through a series of hands-on building exercises, students can use the new Dissectible Robot System from Lab-Volt Systems to study robotic fundamentals, culminating in the assembly of a fully functional, five-axis robot mechanism.

At each step, students are able to program robot motions by using the system's electronic controller module with either a teach pendant or a computer.

Modularity allows instructors to use this mechanism to teach students the basics of stepper motor control and both linear and geometrical arm motion. Next, the student studies the use of optical encoders for feedback. Finally, the student adds turret and gripper to study three-dimensional robot movement and programming.

The system's electronic controller uses the IEEE 696 bus (S-100). A 16-bit CPU sequences robot movements,

READY TO BE ASSEMBLED

while 8-bit microprocessors control individual stepper motors. Extra bus slots permit the instructor to broaden control exercises or experiment with different control technologies, according to the manufacturer. *Lab-Volt Systems, Farmingdale, NJ.*

Write No. 320 on Inquiry Card

Two Video Products For Macintosh Unit

Professional Data Systems has released two video systems for Apple's Macintosh computer that reproduces a Macintosh CRT display on a 23", high-resolution monitor or on a giant screen up to 10' across.

The MACH 1 is a 23", high-res monitor available in white phosphor that operates at Mac's horizontal scanning frequency of 22 kHZ. These monitors can also be "daisy chained" in series to provide for multiple display requirements.

The MACH 2 giant screen video projection system produces a very high resolution picture that is projected on a flat or curved high gain screen up to 10' wide. The projector can be ceiling mounted or attached to an optional mobile cart. *Professional Data Systems, Mill Valley, CA.*

Write No. 322 on Inquiry Card

Options Available For Workstation

Optional add-on equipment is available for the mobile workstation new from HSP Computer Furniture.

The Model 8100 is the basic workstation which includes variable height adjustment, 4" casters and a wooden modesty panel. The Model 8100-A includes a wire management tray to store cords and wires. The Model 8100-B has a multi-plug outlet which is grounded for safety. The Model 8100-C includes an auxiliary video shelf to hold a monitor. The Model 8100-D has a book compartment to keep books and supplies convenient. The Model 8000 comes complete with all options.

The workstation has a height adjustability of 21½" to 26½". Its legs

WITHSTANDS ABUSE

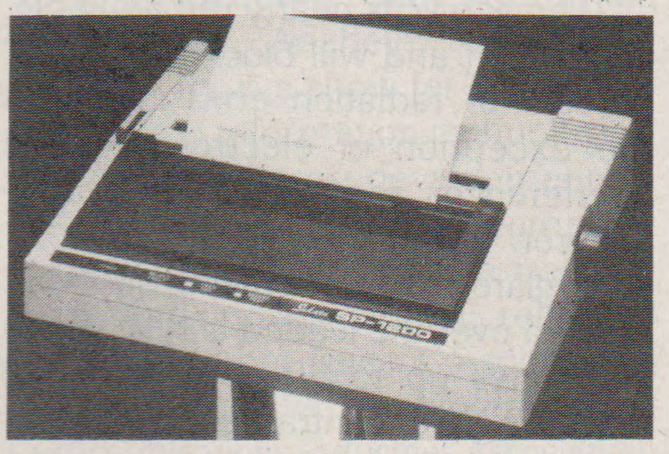
have a chip and scratch resistant finish which withstands abuse, according to the manufacturer. *HSP Computer Furniture, Birmingham, AL.*

Write No. 305 on Inquiry Card

Printer Runs At 120 CPS

Featuring a standard 80 column capacity, Sakata's new SP-1200 serial dot-matrix printer has a printing speed of 120 cps.

The printer has the capacity for emphasized and double-print modes,



LOGIC-SEEKING PRINTING

plus superscript/subscript modes. SP-1200 provides versatility of operation, according to the manufacturers. Both single and double resolution graphic modes are available with SP-1200. Logic-seeking printing or incremental printing with high-response stepping motor are additional features. Fixed pitch and proportional pitch modes are available.

Included is an eight language international character font including French, Spanish, Italian, Swedish, German, Danish and English. The characters available include pica and double-width pica, elite and double-width elite, condensed and double-width condensed and graphic. *Sakata U.S.A. Corp., Elk Grove Village, IL.*

Write No. 371 on Inquiry Card

Users Get Sample Of Database Files

Excalibur Technologies Corp. has released the The Savvy Sampler, a single-disk package that gives users of the IBM PC a taste of the company's Savvy PC database management system.

The sampler comes with designers that automatically generate all the new software required to run files and reports built to user specifications.

The database management system runs on the entire family of IBM PCs and many PC compatibles, according to the manufacturer. *Excalibur Technologies Corp., Albuquerque, NM.*

Write No. 341 on Inquiry Card

Enhancement Board Expands Capabilities

A multi-function card for the IBM PC and compatible computers is available from Orange Micro, Inc.

Called Mr. Chips, the board comes with nine standard features including three ports which allow users to monitor and control a variety of external devices, according to the manufacturer.

Its Real World Interface is a fully addressable 12-bit port. It provides an 8-bit, bi-directional TTL bus and four bits of programmable output for communication with equipment like thermostats, moisture detectors, photocells and other independent devices.

Mr. Chip's dual game port permits monitoring of four variable resistive inputs and four digital inputs. When combined with the Real World features, the port allows the PC to interface with many general purpose instruments, according to the manufacturer. *Orange Micro, Inc., Anaheim, CA.*

Write No. 306 on Inquiry Card

Automatic Dialer Can Alert Parents

Microlog Corp. announces a new automatic dialing instrument called the Truant Educational Support System for use in school systems.

It is designed to automatically dial the parents of children who missed school that day and play a recorded message asking the parents to confirm the child's absence.

This type of equipment has reduced truancy up to 60 percent in many areas, according to the manufacturer. The system can also be used to alert school families of club activities, PTA meetings, field trips, report card issuances, and many other events.

The Truant can operate alone or with a computer. The computer offers storage for a permanent database of phone numbers, names, student identification, and other pertinent information which allows schools to easily create tailored dialing lists for any event.

Components in the Truant system include the Truant computer, transmitter tape deck and tape, power pack, microphone, and operator's manual. Several options are available, as is training and assistance. *Microlog Corp., Gaithersburg, MD.*

Write No. 336 on Inquiry Card

Expansion Device Designed for IIc

Versabox from Prometheus Products, Inc. provides the Apple IIc with a real time clock/calendar, serial and parallel buffered output ports and more.

The parallel interface allows the user to connect the Apple IIc to a multitude of peripherals that require a parallel interface.

The real time clock/calendar, along with the Versabox ProDOS driver, enables the Apple IIc to read the date and time from the Versabox.

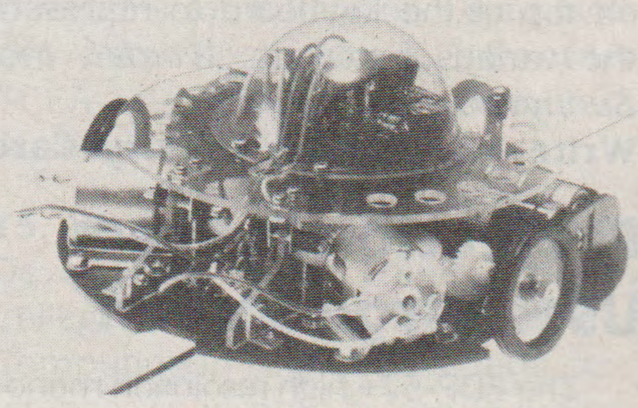
It connects to the Apple IIc's serial printer port and provides both a serial and parallel output port. *Prometheus Products, Inc., Fremont, CA.*

Write No. 335 on Inquiry Card

Robot Guided by Infrared Sensor

A new, low cost, line tracer robot introduced by Stock Model Parts utilizes an infrared light sensor to guide it along any black-line pathway.

A black felt-tipped marker or electrical tape can be used to create a straight or curved pathway. Applications include school science projects and robotics courses to learn about how infrared sensors work, according to the manufacturer.



HAS 6" TURNING RADIUS

The three-wheeled robot—Model 4Z6-911, Line Tracer II—is offered in kit form. All electronic elements are contained in two, pre-soldered and pre-tested printed circuit boards.

The robot measures 5½" in diameter and is 2½" high. *Stock Model Parts, New Hyde Park, NY.*

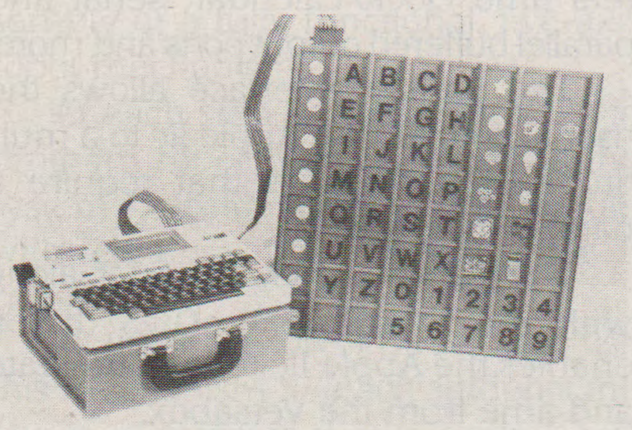
Write No. 331 on Inquiry Card

(continued on page 130)

Products *(continued)*

Enlarged Keyboard For Handicapped

A new, enlarged keyboard for the Words+ Portable Voice II, makes communication easier for disabled adults and children who are unable to use a



ATTACHES TO EPSON HX-20

regular typewriter-size keyboard, according to its manufacturer. The device connects an Epson HX-20 Notebook Computer to a voice synthesizer.

The new custom-made keyboard has keys twice as large as standard keyboards. The larger keys make it easier for people with poor motor skills to strike the right keys. When keys are struck, the computer prompts the voice synthesizer to "speak" specific words or phrases.

In addition, the portable Voice II can be programmed to have more than one meaning for each key. Users can take advantage of this additional capability by using keys that are labeled with several symbols, each representing a single function. Or, the user can also slip specially-designed overlays on top of the keyboard to represent the various functions. *Words+, Inc., Sunnyvale, CA.*

Write No. 311 on Inquiry Card

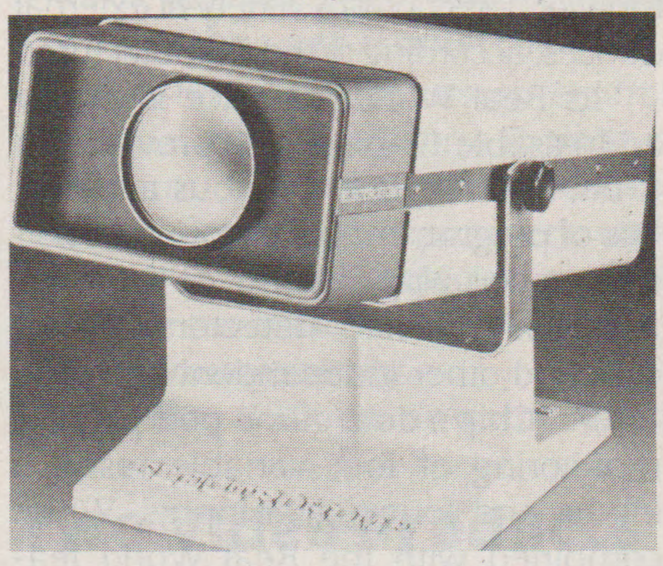
Projection System Uses Large Screen

The EDP-57+ high resolution monochrome data/graphics projection system now incorporates up to 1,000 lines resolution, increased horizontal scan rates to 33KHz, and flat/curved screen corner focus adjustment, according to its manufacturer, Electrohome Ltd.

This unit provides group viewing of computer-generated alphanumeric and graphic monochrome information on a large screen for software demonstrations, training sessions, classroom presentations and other group presentations.

The EDP-57+ can be used on any screen material and provides projection of 80-character information on surfaces up to 10′ diagonal, according to the manufacturer.

The accessory package includes a 6′ curved screen, adjustable floor stand,



UP TO 1,000 LINES RESOLUTION

desk mount, ceiling mount, plus special interfaces. *Electrohome Ltd., Kitchener, Ontario.*

Write No. 304 on Inquiry Card

Two Color Monitors For Educational Use

The CV2560 and CV2562 25″ color monitors have recently been added to the Zenith Data Systems' product line.

Both monitors have extensive application for the educational market, especially the college market, according to the manufacturer.

In large classrooms, it is often necessary to connect several monitors to one source, such as a computer or VCR.

These new monitors feature audio/video loop, permitting "daisy chains" in composite video mode.

The CV 2560 features a tri-focus picture tube system with Zenith's EFL electron gun which has three focusing rays to concentrate the electron beam and produce a smaller spot size than is possible with most one-gun systems, according to the manufacturer.

The CV2562 features the Zenith Hi-Bi picture tube with Zenith's H-Bi electron gun with bipotential focusing action. The unit also features a removable dark glass front panel to help absorb ambient room light that can cause viewing problems. *Zenith Data Systems, Glenview, IL.*

Write No. 326 on Inquiry Card

CRT/VDT Filter Screens Radiation

The I-Protect filter, new from I-Protect, Inc., is an anti-glare, contrast enhancement, radiation-blocking CRT/VDT filter. It is made of leaded acrylic which was developed as an alternative to industrial leaded glass.

The acrylic is nearly unbreakable, lightweight and will block up to 97.7 percent of radiation emissions with the exception of electro-magnetic interferences, according to the manufacturer.

A glare reduction coating has been applied over the leaded acrylic which eliminates up to 90 percent of the reflected glare. Contrast enhancement is accomplished through the use of a circular polarizer which transforms a harsh, unfocused, projected image into readable print, according to the manufacturer.

The filters come with a black aluminum frame, and are attached to the terminal with self-adhesive velcro mounting strips. *I-Protect, Inc., Los Angeles, CA.*

Write No. 319 on Inquiry Card

New Microcomputer Accesses 16 Colors

The Regency R2-C color microcomputer can interface with videodisc and videotape, printers, bitpads and other devices. Its high-resolution, touch sensitive color screen can simulate work experience in any technical setting, according to the manufacturer.

The new color display can simultaneously access 16 colors out of a possible 256. Commands for adding or changing colors make it easy to use color for emphasis in lessons or to create realistic representations out of complex technical and scientific apparatuses.

In the four-screen mode, the courseware designer can avoid time-consuming display creation time by plotting a new, non-displayed screen while waiting for a student keypress on a previous screen. After the student input, the author can instantly display the prepared screen. *Regency Systems, Inc., Champaign, IL.*

Write No. 323 on Inquiry Card

Calendar

January

16-21, Anaheim, Calif. Commtex International, Anaheim Convention Center. This is a show for communications and information technologies. It features the latest developments in audio/visual, video and computer products for education, job training, marketing, industry, public relations, and many other fields. Co-sponsored by A.E.C.T. NAVA, the International Communications Industries Association, is holding its annual convention in conjunction with the show. Contact: ICIA, 3150 Spring St., Fairfax, VA 22031, (703) 273-7200.

22, Dallas, Texas. Uniform, the International Conference of UNIX System Users, Dallas Market Center. Uniform '85 will highlight software, hardware, peripherals and services based on AT&T's UNIX operating system. The event is being held in conjunction with the grand opening of Infomart, a 1.5-million square-foot information processing market center. Contact: Richard Lewis, Professional Exposition Management, 2400 E. Devon Ave., Ste. 205, Des Plaines, IL 60018, (800) 323-5155.

24, Princeton, N.J. Selecting and Evaluating Instructional Courseware, Educational Testing Service Technology Center. This one-day seminar is designed for educators interested in identifying sources of courseware; conducting in-depth courseware evaluations; and selecting and using courseware directories, clearinghouses, databases and published reviews. Contact: Corrine Cohen, Educational Testing Service, Princeton, NJ 08541, (609) 734-1108.

28-31, Washington, D.C. Communication Networks Conference & Exposition, Convention Center. This trade show will cover voice and data telecommunications, electronic mail, data processing, data communications and networking with a personal computer. Contact: Judie McDaid, CW Conference Management Group, 375 Cochituate Road, Box 880, Framingham, MA 01701, (800) 225-4698 outside Massachusetts, or (617) 879-0700 in Massachusetts.

28, Orlando, Fla. Computer Workshops for the Modern Educator, Sheraton-Twin Towers and Howard Johnson's Florida Center Hotels. Twelve half-day workshops will be conducted in conjunction with the Florida Instructional Computing Conference, which begins Jan. 29. Workshop titles include: Computer-Assisted Videodisc Instruction, Hands-on Approach to Evaluating Computer Courseware, and A Computer Management System to Track Basic Skills. Contact: AEDS, 1201 16th St., NW, Washington, DC 20036, (202) 822-7845.

29-31, Orlando Fla. Fifth Annual Florida Instructional Computer Conference, Sheraton-Twin Towers and Howard Johnson's Florida Center Hotels. Approximately 100 nationally recognized speakers will be presenting papers on a wide range of topic areas. Some 2,500 teachers and administrators are expected to attend. Pre-conference workshops will be offered on Jan. 28. Contact: David Brittain, Director, Office of Educational Technology, Department of Education, Knott Building, Tallahassee, FL 32301, (904) 488-0980.

February

1-2, Los Angeles, Calif. Computers & Reading/Learning Difficulties Third Annual Western States Conference, Airport Hilton. This conference is targeted for educators who use computers to deal with learning difficulties. More than 60 seminars and workshops will address utilizing microcomputers; evaluating software; authoring systems; LOGO; computer literacy; and word processing as it relates to writing skills. Contact: Educational Computer Conferences, 1070 Crows Nest Way, Richmond, CA 94803, (415) 222-1249.

4-6, Atlanta, Ga. Office Automation Conference, Georgia World Congress Center. The theme of the 1985 OAC is, "Today's Partnership: People and Technology." Emphasis will be on state-of-the-art office solutions and the need to increase human and systems integration for increased productivity. In addition to a conference program and seminars, there will be 175 exhibitors. Contact: American Federation of Information Processing Societies, Inc., 1899 Preston White Drive, Reston, VA 22091, (703) 620-8940.

11-12, San Francisco, Calif. Western Educational Society for Telecommunications 14th Annual Conference, Civic Auditorium. Being held again in conjunction with Knowledge Industries' Video Expo, the WEST conference program will focus on four tracks: public broadcasting; educational institutions; interactive video; and industrial production, foundations and commercial production agencies. Contact: William S. Craig, IMC-TV Department, Central Washington University, Ellensburg, WA 98926, (509) 963-1223.

13-15, Orlando, Fla. Third Conference on Interactive Instruction Delivery, Sheraton Twin Towers Hotel. The conference will feature presentations on the use of interactive microcomputer and videodisc technology in training, education and job performance applications. Contact: Raymond G. Fox, Society for Applied Learning Technology, 50 Culpeper St., Warrenton, VA 22186, (703) 347-0055.

13-16, Austin, Texas. Texas Computer Education Association Fifth Annual Conference, Hyatt Regency Hotel. The theme of the conference is "New Directions for Education Using Modern Day Technology." Contact: TCEA—Conference, P.O. Box 2573, Austin, TX 78768.

15, Waltham Mass. Microcomputer Developments and Trends, Bentley College. This is one of a series of Computing in Higher Education conferences sponsored by the New England Regional Computing Program. Others on different topics are scheduled for March 2, March 15 and April 26 at various northeastern locations. Contact: New England Regional Computing Program, 439 Washington St., Braintree, MA 02184, (617) 848-6494.

20-22, Arlington Heights, Ill. The Role of the Computer in Education 5,

(continued on page 132)

Calendar *(continued)*

Arlington Park Hilton. This conference will offer in-depth sessions covering a wide range of educational topics. Contact: Rick Nelson, Micro-Ideas, 2701 Central Road, Glenview, IL 60025, (312) 998-5065.

March

2, Wellesley, Mass. Computing in Biological and Life Science Education (Academic Computing), Wellesley College. This is one of a series of Computing in Higher Education conferences sponsored by the New England Regional Computing Program. Others on different topics are scheduled for Feb. 15, March 15 and April 26 at various northeastern locations. Contact: New England Regional Computing Program, 439 Washington St., Braintree, MA 02184, (617) 848-6494.

3-8, Bloomington, Ind. The Audio-Visual Institute for Effective Communications, University of Indiana. Sponsored by NAVA, the International Communications Industries Association, the institute provides the training and communications specialist with a comprehensive and practical overview of A/V communications techniques. The current program emphasizes the application of techniques required to create a finished project and is structured to allow attendees to follow a particular project through the production process. Contact: NAVA, the International Communications Industries Association, 3150 Spring St., Fairfax, VA 22031-2399, (703) 273-7200.

4-6, Arlington, Va. Computer-Based Training: How to Plan, Design, Evaluate and Implement; Pentagon Quality Inn. This professional development seminar, sponsored by the Learning Technology Institute, is designed for individuals who are involved in recommending, designing, installing or evaluating the use of CBT. Contact: Learning Technology Institute, 50 Culpeper St., Warrenton, VA 22186, (703) 347-0055.

4-7, Washington, D.C. Federal Office Systems Expo, Convention Center. FOSE '85 is a national conference and exposition serving the information needs of both federal government and private sector in the area of office automation and integrated information systems. The conference will be held March 4 through 7, with the exposition beginning March 5. Contact: Jill Nieman, National Trade Productions, Inc., 2111 Eisenhower Ave., Suite 400, Alexandria, VA 22314, (800) 638-8510 or (703) 683-8500.

4-7, Washington, D.C. FOSE Software '85, Convention Center. Held in conjunction with the Federal Office Systems Expo '85, this four-day conference and three-day exposition is designed specifically for large-volume software purchasers in business and government. Contact: Jill Nieman, National Trade Productions, Inc., 2111 Eisenhower Ave., Suite 400, Alexandria, VA 22314, (800) 638-8500 or (703) 683-8500.

7-8, Arlington, Va. Computer-Assisted Instruction (CAI) Course Design, Pentagon Quality Inn. The purpose of this workshop is to introduce administrators and managers to the reality, problems and potentials of high technologies in education and training; to familiarize them with the elements of computer-assisted and computer-managed instruction; and to provide them with an opportunity to practice. Contact: Learning Technology Institute, 50 Culpeper St., Warrenton, VA 22186, (703) 347-0055.

12-14, New Orleans, La. Association for Computing Machinery Annual Computer Science Conference, the Marriott. "Agenda for Computing Research: The Challenge for Creativity," is this year's theme. The technical program blends the traditional emphasis on abstracts of current research with presentations of invited and refereed papers, panels and tutorials. The central themes on each of the three days are: "Digital Systems Description, Design and Synthesis Techniques"; "Integrated Information Systems"; and "Distributed Processing, Distributed Control and Distributed Data." ACM, 11 W. 42nd St., New York, NY 10036, (212) 869-7440.

13-15, Tempe, Ariz. Microcomputers in Education Conference, Arizona State University College of Education. Titled, "Tomorrow's Technology," the conference will bring together professionals from various fields of education to share microcomputer applications for today and tomorrow. Emphasis will be placed on integrating uses of computer languages and technology into the education environment. Contact: Donna Craighead, College of Education, Arizona State University, Payne B47, Tempe, AZ 85287, (602) 965-7363.

15, Smithfield, R.I. Integrated Packages, Bryant College. This is one of a series of Computing in Higher Education conferences sponsored by the New England Regional Computing Program. Others on different topics are sheduled for Feb. 15, March 2, and April 26 at various northeastern locations. Contact: New England Regional Computing Program, 439 Washington St., Braintree, MA 02184, (617) 848-6494.

18-20, Tucson, Ariz. First Annual Conference on Technologies in Education, University of Arizona. The primary focus of the conference is the effective implementation of research in educational technology. The event is being co-sponsored by the University of Arizona's Department of Educational Psychology and the National Advisory Council for Computer Implementation in Schools. Contact: Steve Louie, NACCIS, 2200 E. River Road, Ste. 125, Tucson, AZ 85718, (602) 323-6144.

18-20, Dallas, Texas. International Computer and Telecommunications Conference, Infomart. Comtel '85 will focus on merging the technology of telephones, computers, software and peripherals as they apply to small and large business and educational environments. Contact: Comtel '85, Director of Communications, International Computer & Telecommunications Conference, 5080 Spectrum Drive, Suite 707E, Box 17, Dallas, TX 75248, (214) 631-6482.

21-22, Newark, Del. Computers and Young Children, University of Delaware. Opportunities and problems educators face as computers are introduced into educational programs will be covered, with emphasis on programs for children 4 to 8 years old. Contact: Sandra Morris, Instructor, Individual and Family Studies, College of Human Development, University of Delaware, Newark, DE 19716, (302) 451-2304.

23-25, Chicago, Ill. Association for Supervision and Curriculum Development 1985 Annual Conference and Exhibition, Hyatt Regency Hotel. The theme of this year's conference is "Exalting Teaching and Learning." Experts and practitioners from all areas and levels of schooling will address present and future trends in education. Contact: ASCD, 225 N. Washington St., Alexandria, VA 22314, (703) 549-9910.

25-27, Washington, D.C. Third Annual Conference on Optical Storage of Documents and Images, Shoreham Hotel. Contact: Joanna Spilman or Judy Hanson, Technology Opportunity Conference, P.O. Box 14817, San Francisco, CA 94114-0817, (415) 626-1133.

25-28, Philadelphia, Pa. Association for the Development of Computer-Based Instructional Systems (ADCIS) 26th International Conference, Adam's Mark Hotel. ADCIS is a professional organization for applied research in use of computers for support of direct instruction. Members include faculty and staff in a variety of academic areas as well as computer-based training professionals in industry. Contact: ADCIS International Headquarters, Miller Hall 409, Western Washington University, Bellingham, WA 98225, (206) 676-2860.

27-29, Arlington, Va. Instructional Systems Design, Pentagon Quality Inn. This workshop provides an overview of the teaching-learning process. Through presentations, exercises, examples and other material, attendees will be exposed to fundamental learning theory, current instructional design and delivery and evaluation procedures. Contact: Learning Technology Institute, 50 Culpeper St., Warrenton, VA 22186, (703) 347-0055.

28-29, Santa Cruz, Calif. Western Educational Computing Workshops, University of California. Sponsored by the California Educational Computing Consortium, these workshops provide demonstration and hands-on experience with new computer applications, software and hardware. Contact: Hal Roach, Computer Services, Mt. San Antonio College, 1100 N. Grand Ave., Walnut, CA 94542.

30-April 2, San Francisco, Calif. West Coast Computer Faire 10th Annual Show, Moscone Center. This end-user and trade show focuses on microcomputer systems and software supplies and suppliers. Contact: Computer Faire, Inc., 181 Wells Ave., Newton, MA 02159, (617) 965-8350.

30-April 2, Denver, Colo. National Association of Elementary School Principals Convention and Exhibition, Denver and Colorado Convention Complex. Contact: National Association of Elementary School Principals, 1920 Association Drive, Reston, VA 22091, (703) 620-6100.

31-April 3, Atlanta, Ga. Softcon, Georgia World Congress Center. This is an annual trade show emphasizing software. Northeast Expositions, Inc., producers of Softcon, have decided to move the 1985 spring show from New Orleans to Atlanta to accommodate the large number of exhibiting vendors. Contact: Northeast Expositions, 822 Boylston St., Chestnut Hill, MA 02167, (617) 739-2000.

ADVERTISER INDEX

IN OUR NEXT ISSUE

"Special Education" is the theme of next month's edition of T.H.E. Journal. Educators and others nationwide are striving to improve and enhance the quality of learning for handicapped students both young and old. In February we pay tribute to those efforts.

Out of upstate New York comes a feature titled, "Word Processing for Special Education Students: Worth the Effort." Co-authored by **Learning Disability Specialist Sarah Degnan** of the **Special Education Trainir.g and Resource Center,** and **Dr. Jeffrey W. Hummel** of the **University of New York at Buffalo,** this article focuses on the various aspects of word processing including programs, student motivation and its potential benefits.

Dr. Stephen Rogers, Professor of Liberal Arts at **Notre Dame University,** doesn't let the fact that he is blind get in the way of his daily work. Utilizing a speech synthesis device connected to a microcomputer, the professor says that it has revolutionized his life. In a first-person account titled "The Talking Apple," Rogers tells how he has used the new technology to overcome cumbersome Braille in preparing academic manuscripts.

Synthesized music has become the foundation of today's modern tunes. With the aid of a microcomputer and the right peripherals and software, a single person can duplicate the sounds of a symphony orchestra. That same hardware and software can also be put to use as an educational and therapy tool with handicapped students. **Russel T. Osguthorpe, Associate Professor of Educational Psychology** at **Brigham Young University** and **Mary T. Ditson, Certified Music Therapist** for the **Provo School District,** have collaborated on a piece titled "The AlphaSyntauri Synthesizer as a Music Therapy Device for Handicapped Students," which tells how synthesized music can be utilized to emphasize basic music skills, creativity, socialization and communication.

The medium of film cuts across all ethnic, regional, cultural and class lines. For a teacher of emotionally handicapped and learning disabled students in an inner-city junior high school, this fact was good to know. In "Developing a Classroom-Based Film-Making Program," **Donald T. Curran** tells how he planned, funded and implemented his project at school. Included are several valuable tips on animation techniques, time-lapse photography and other special effects using a home movie camera.

These and other features have been assembled for February's issue as an invaluable resource for the readers of T.H.E. Journal.

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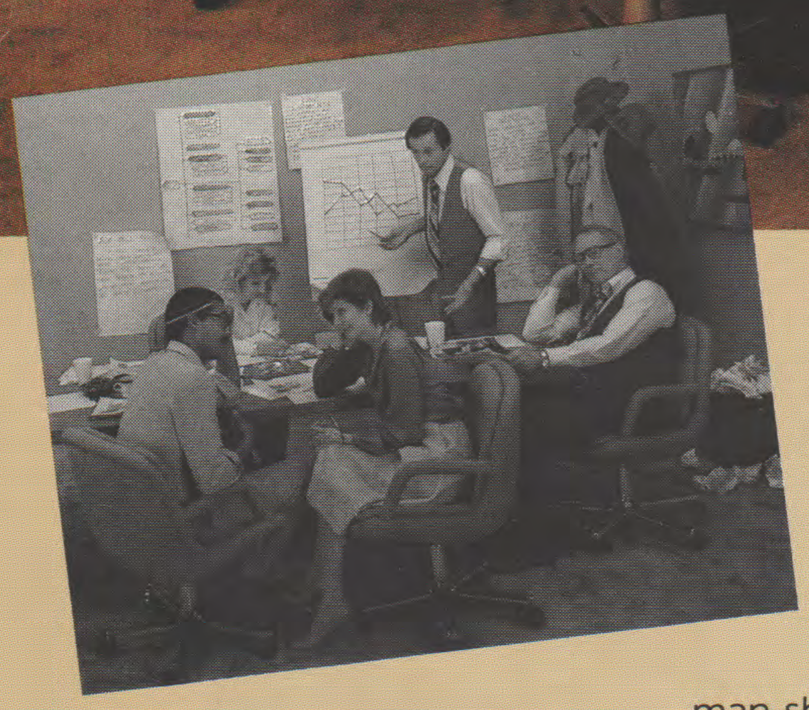

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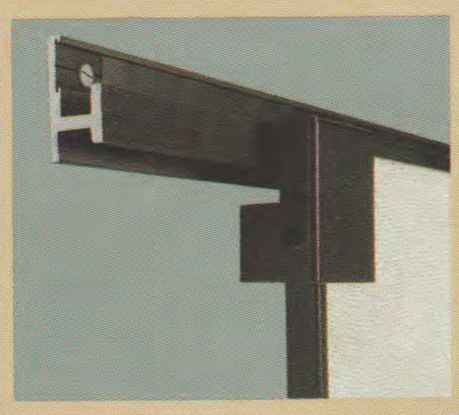

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